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ILLUSTRATIONS.

Milan Cathedral Façade Competition.—Design by Messrs. Hartel & Neckelmann 430-431
Design for Façade, Milan Cathedral.—By Messrs. Pugin & Pugin 434-435
New Houses, the Beach, Walmer, Kent.—Mr. James Neale, F.S.A., Architect 438-439
A Country House.—Mr. Langton Dennis, Architect 442
Entrance Lodge at Walmer, Kent.—Mr. James Neale, F.S.A., Architect 443

CONTENTS.

The Milan Cathedral Competition 519
Photography and Art 520
Notes 521
Notes at the Exhibition of Ecclesiastical Art at Wolverhampton 523
The Condition of the Thames 525
Architectural Association *Conversazione* 525
New Hospital, Kingsland-road 525
Nos. 3 & 4, Lincoln's Inn-fields 526
The Walls of Chester 526
Designs for Milan Cathedral Façade 527
New Houses, the Beach, Walmer, Kent 527
A Country House 527
Entrance Lodge, Walmer, Kent 527
"Shone's Ejectors in the Recent Rainstorms" 546
"New Method of Ventilation" 546
Ordnance Map Scales 547
Fires in Theatres 547
Cooking Stoves 547
Provincial News 547
Church-Building News 547
The Student's Column: Land Surveying and Levelling.—XVI. 548
Stained Glass 549
Recent Patents 549
Recent Sales of Property 549
Meetings 549
Miscellanea 549
Prices Current of Building Materials 551

The Milan Cathedral Competition.

HOW far the fourteen architects* who are to join issue in the final competition for the façade of Milan Cathedral will keep to the lines and character of their first sketches it is, of course, impossible to say; but we may presume that the second series will not differ materially from the first, as most of the competitors will naturally reason with themselves that they were selected for certain qualities exhibited in their first designs, and that it will be, to say the least, prudent not to depart very far from these, lest in so doing they should unwittingly part with the very qualities which gained them the premium in the first instance. What it is proposed by the competitors to put in the place of the present jumble of a façade we can therefore pretty well guess; and it is of some interest to consider what has to be done, and which of several principles shown in the first designs is to be preferred.

According to the constant habit in Italy, Milan Cathedral, built late in the fourteenth and completed (except the façade) in the fifteenth century, was left without the façade in the hope that, by taking more time to think about it, something finer could eventually be achieved than was apparent at the moment. This habit of Italian architects, though it looks rather like being afraid of their job at the time, has had the advantage of leaving some splendid pieces of work to do for their successors, and providing a constant subject of architectural interest and excitement in the efforts made from time to time by this or that architect to produce a design worthy of the occasion, and to get it accepted and carried out. Florence has waited till the present day for the completion of its front; Milan is only just now in prospect of seeing the work carried out; and there are many lesser buildings in Italy still awaiting the addition of that architectural frontispiece which, in all probability, they are doomed to fall into decay without ever receiving. Milan, however, has the funds, or the greater part of them, in hand, through the munificence of a late citizen, and the completion is likely to turn out a solid thing, and not a mere affair on paper; so that the result becomes a matter of, we may hope, some immediate interest.

There have been various designs made for the façade at different times. Pellegrini had a commission to complete it in the sixteenth century, and did actually produce a Classic façade somewhat of the style of Carlo Maderno's west front of St. Peter, with an enormous order and a *fronton* in the centre of it, of which Fergusson truly observes that "it was fortunate that it was not carried out." Apparently, however, his Classic doorways were built in the middle of the blank façade, because the design of Buzzi, made early in the seventeenth century, which in its general lines is evidently designed to match the features of the Gothic edifice in the rear, nevertheless shows purely Classic doorways and windows closely resembling those actually existing. The actual façade, completed in the early part of the present century by Amati, seems to have been partly suggested by Buzzi's; at all events, it represents the same general idea, imitation Gothic details built up around Classic doors and windows, in the attempt to connect together these two incongruous elements.

In both designs, massive Gothic buttresses or piers are run up between the ranks of the Classic window openings and pediments, but Buzzi's design differs in one important respect from the existing one, in that it terminates with a large tower and spire at each extremity or flank of the façade. The existing façade has only a large panelled pier,—architecturally speaking, a collection of buttresses and pinnacles, at the angles; massive enough, but nothing to call a tower. It is this very question, whether the new façade should or should not have flanking towers, which has been greatly debated at Milan; though this is only one of two or three crucial questions which suggest themselves in considering the subject.

It is an understood condition, specially named in the first conditions of competition, that the designs must conform to the style and the architectural arrangement of the building; and in all but one of the first designs there seems an obvious intention to do this. As to the general style of the building there is, of course, no difficulty in defining what that is, and in following it in the new design. There is of course the question, which some critics may raise, as to whether a façade may not be regarded as a separate work in itself, to be judged apart from the rest of the building, and erected in any style which the architect feels most in sympathy with, or which is the favoured style of his day. Of course this has been done in other instances, but we do not think precedent justifies it. With the exception of the front, Milan is homogeneous in style and built very nearly in one period. The addition of the façade should be the completion of the design, not a new feature, however effective, in an incongruous style. This conclusion, we fear, condemns the design of the only English architect, Mr. Brade, who was fortunate enough to be numbered among the chosen fifteen. His design, the small illustration of which, reproduced from *L'Illustrazione Italiana*, gives a sufficient general idea of the treatment, is evidently a fine piece of modern Gothic, and it is probable that the complete drawings on a larger scale would quite justify the compliment that has been paid to his ability; but such a design is absolutely unsuited for the position, and would, in fact, be absurdly incongruous; and while we are glad that one English architect, at least, has been found worthy to be counted among the successful ones, we should be still more pleased if his design had been one which we could wish to see carried out, and which we could conscientiously support as one with a high claim to be chosen. This it is impossible, however, to do; the choice of a design in a school of Gothic so different from that of Milan would be a complete mistake, and would be felt to be so by Italian architects and critics generally, if we are not much mistaken; and Mr. Brade would do wisely, if he really wishes to have a chance of ultimate success, to modify his design in the second competition so as to harmonise with the environment.

It may be a question whether, as the general mass and proportion of the existing façade have become familiar to the eye, the new design should not more or less conform to its general outlines and proportions. Some of the competitors evidently have thought so, and have aimed at doing this, among them Signor Locati, of Milan, the small engraving of whose design we give from the Italian paper before named. The main arrangement of this has much similarity to that of the existing façade; the chief difference being that a circular window is substituted under the central gable, and that the raking lines of the front are made much lower and flatter in their slope. The slope of the existing façade follows the steep lines of Buzzi's design, and one or two other competitors also have followed this precedent, but it is not a good one. It is next to impossible to give monumental character to the front of a great cathedral with a gable termination with steeply-sloped lines. The thing becomes smaller and loses dignity at once. The design of Signor Locati avoids this defect, and is fairly monumental in style, and may be said to be one of the best and most suitable of those in which towers are not included; but one must admit that, though in good taste, it is rather mechanical in design, and does not show any stroke of genius.

The questions which concern the suitability of the new design to the architectural arrange-

* The number is reduced to fourteen, as our readers may remember, by the lamented death of Tschagin, the Russian architect, one of the fifteen selected competitors.

ment of the present building, are principally the extent to which the sloping lines of the roofs should or should not be expressed in the lines of the front, and whether the doors should be arranged so as to indicate and form entrances to each of the five aisles. This latter point is also one which has been much discussed. The five-aisled plan is one of the prominent characteristics of the church, and should be distinctly expressed externally. A cathedral church with three aisles usually shows three doors in its façade, and on the same principle it would seem right that the five aisles should express themselves externally likewise. The selected competitors themselves show a majority in favour of this view: nine of them show five doors; MM. Hartel and Neckelmann show two centre doors and two side ones; Herr Becker, Signor Brentano, and Signor Beltrami show three; and Signor Azzolini shows an alternative elevation with three or five doors. There is something to be said in favour of the greater mass given to the outer portions of the façade by not cutting doors out of them; but the whole question depends somewhat on the general treatment of the design. The question is about the outer doors; there can be no doubt that the pair in the intermediate portion of the façade are desirable; and all the competitors are in agreement on that head. Where the outer pair are added they should at least be small ones, unless where there is a great mass of building placed at the extremity of the façade and accentuating it. Thus in M. Deperthes' design, where there are angle towers which overtop the central lantern, the large doors at the outward position are rightly placed. In such a design as that of Signor Locati it would, of course, have been a complete mistake to have placed large doors in this portion of the façade; though his range of doors, diminishing each way in a kind of arithmetical progression, has again, like the rest of his design, a somewhat mechanical appearance. Altogether, we may conclude that while most considerations are in favour of the five-door arrangement, the point must be decided with reference to the general architectural treatment of each design.

The question of towers or no towers is a more difficult one. Fergusson was of opinion "that the want of some such features is greatly felt in the building as it stands," and we are disposed to agree with him. The question is whether they should be dominate or be subordinate to the central tower. Our opinion would be that the best result would be obtained by towers on a tolerably large scale, but just sufficiently subordinate to the central tower to group as subordinate. M. Deperthes, as will be seen from the small illustration of his design (also from a cut in *L'Illustrazione Italiana*), has thought this subordination unnecessary, and has carried up his new towers to almost exactly the same height as the central one; indeed, slightly overtopping it. We cannot think this kind of three-legged composition would be satisfactory, though M. Deperthes' front is a vigorous and spirited design in itself. The late M. Tschagin, whose design we also give (from *L'Illustrazione*), has shown a better sense of proportion and subordination in his treatment of the towers, which in this case, however, are placed over the ends of the intermediate and not of the outer aisles. The effect of this is good enough in the elevation of the façade, but how would it be in the view of the building seen from the opposite direction, with the ends of the outer aisles projecting beyond the towers?

On the whole, we may divide the selected designs into (1) those which employ a central mass and no flanking towers; (2) those which employ towers over the intermediate aisles; and (3) those which employ towers over the outer aisles or at the extreme ends of the façade.

Of those which treat the building with towers over the intermediate aisles and not at the extreme angles, is that of MM. Hartel and Neckelmann, of Leipzig, of which we are enabled to give a larger-sized illustration from a photograph from their drawing, furnished by the authors. Here the western towers are kept a little in subordination to the central tower, and the architects have been able, by keeping the towers towards the centre, to get sufficient appearance of height to harmonise with the general character of the rest of the building, without carrying their towers actually to such a height as to overpeer the central tower; and this is one of the advantages of the arrangement of keeping the towers towards the centre instead of at the extreme angles of the façade. The design by the late M. Tschagin places the towers, as we observed, in the same manner, but keeping them lower, and this appears to us to be one of the best compositions of the set. The question of indicating the rake of the roofs in the façade is very variously viewed by the competitors. In Tschagin's design, as will be seen, the centre portion is kept horizontal, and the side aisle terminations beyond the towers are shown with a slope. MM. Hartel and Neckelmann reverse this treatment, and keep the wings horizontal. Theirs is, perhaps, the preferable method, if the slope is not shown in both portions, but we do not like the strong horizontal band being left with nothing over it between the large towers and the angle turrets; it certainly wants a little filling in and connexion there; the tall angle turrets are too much cut off from the main mass of the façade. The method of keeping the large towers at the extremities of the façade is illustrated in the other lithograph, illustrating a design submitted by Messrs. Pugin & Pugin. The large drawing from which this was taken in pencil, washed with Indian ink, is very sketchy in execution, and has come out proportionately so in the lithograph, but it shows the general effect of the design. This design had the misfortune of being delayed several days on the road beyond what it should have been, and the authorities, keeping to the letter of the law, though they exhibited it with the others, refused to allow it to be included in the competition. Mr. Brade is one of those who has adopted the principle of having a very lofty and important central gable, the side towers being kept rather in subordination; the central feature is very finely treated in itself, though, as observed, quite out of keeping with the style of the main building. The design by M. Deperthes, the Parisian architect, though there is a great deal of vigour about it, strikes us as too wide; in the elevation the central tower seen in the rear fills it up, but when seen in perspective apart from this combination, it would appear rather abnormally high at the angles and wanting something in the centre of the skyline to connect the whole. In the design by Signor Moretti, of Milan, the central feature is strongly emphasised, the whole running very much on the lines of the existing façade, except that the angle portions are raised into richly-treated spires, which are, however, slightly subordinate to the central finial in height. In general composition, Signor Moretti's is a very well thought out design, and entirely in keeping with the character of the building. Herr Dick, of Vienna, has had the "votive church" in his mind, and runs up two immense spires at the extreme angles on the same kind of lines as the famous Vienna spire, and far out-topping the central spire. We prefer to leave the latter predominant, though Herr Dick's design is a very impressive if rather a sensational one; Signor Brentano, of Milan, shows something of the same character of design and composition, but on a much smaller scale, and keeping the spires in subordination to the centre. The design by Signor Beltrami, of Milan, eschews towers altogether, having a centre mass with a low-pitched pinnacled gable, and dropping the side masses successively at the ends of the intermediate and outer aisles respectively. This is a design showing much fine detail, and, thanks to the author's courtesy in sending us photographs, we shall be able to illustrate it shortly. It has the merit of precisely expressing the composition of the building in the rear of the façade. A special point in this design is the proposition to build a campanile (as mentioned by Mr. Waterhouse in a communication to the *Builder* of June 11th of this year), not in immediate connexion with the façade, but as a central object in the square in front of the cathedral, working into it the Renaissance details of the existing façade. Signor Azzolini, of Bologna, and Signor Nordio, of Trieste, adopt much the same principle of design as Signor Beltrami, but the raking line is too marked and too prominent in both their designs, giving a triangular or gabled effect which is by no means dignified in so large a structure. The design by Signor Ferrario, of Milan, is one with lofty spires at the extremities, and a comparatively low centre; that of Signor Bianchi, of Milan, much on the same lines, but the centre is kept higher, and so far it is better; in Signor Ferrario's there would be too great a gap between the towers. In both these last two a bad effect is produced, to our thinking, by the raking lines over the intermediate aisles dropping towards and butting against the towers; this has an awkward effect: it would have been better to connect the towers horizontally with the central mass. Herr Becker's design is another of the "triangular" fronts, the raking line being carried right down from the point of the central gable to the extreme end in a straight line, scarcely broken by the heads of buttresses running through it. That is certainly not the way to do it. Another Vienna architect, Herr Weber, adopts somewhat the same principle, only treating the outer aisles with horizontal cornices at a lower level. In both these designs the centre gable, running up to a mere point with nothing to give accentuation to it, has a poor and weak effect. In both of them, on the other hand, the principal portals are treated in a fine and bold manner.

There is none among the designs but has its fine points, and there are several among them which are unquestionably fine conceptions, and would form a not unworthy completion to the building; and nearly all of them appear to have been designed with a conscientious effort to produce something in keeping with the character of the cathedral.

PHOTOGRAPHY AND ART.

THE annual exhibition of the Photographic Society of Great Britain, at present open in the rooms of the Society of Water Colours, contains a good many things that are really worth looking at for their success of execution or for the beauty of the objects which they represent; and though the interest which this exhibition excites is cold indeed compared with that aroused by the class of exhibitions which we are accustomed to see in these rooms, the very contrast of feeling naturally suggests some reflections as to the contrast between these two methods of representation, the chemical and manual, and what photography can and cannot accomplish.

The days are long past when photography offered to us as representations of landscape only some half intelligible assortments of masses of dark and light. Comparatively speaking, the advance of late years is wonderful in this department of photographing; and a good many of the landscape photographs can be really enjoyed for their intrinsic beauty of representation. In almost all cases, indeed, it would seem that something is lost; one point is sacrificed to another, except where the scene offers special circumstances peculiarly suitable to be dealt with by photography. "A Frosty Walk" (31), for instance, by Mr. H. Tolley, represents a phase of nature, the ground whitened by hoar frost, which falls in admirably with the special powers and the characteristic tone of photography. In "At Ilam, Derbyshire" (52), by the same exhibitor, the main point in the picture consists in the complex and delicate ramifications of the boughs and twigs of a bare tree, which form a network across nearly the whole surface of the picture, leaving the landscape to be seen through them. This anatomy of the tree, caught in every detail with the greatest sharpness, is an exquisite object in itself, and it is of real value in another sense, as a record of natural fact more elaborate than any painter

could emulate by the labour of the eye and hand. "Falcon Crag, Derwentwater" (235), again, by Mr. T. A. Green, is composed in this way of a foreground tree, a noble tree, and a distance retiring behind it; the distance is beautifully soft, but we fancy something of it has been lost and that the softness is really incompleteness; nevertheless, the result is beautiful in its way. Mr. Scamell's "Cottages at Steventon" (557), with the minute elaboration of the foliage and the broad mass of white light on the houses, is a most effective little bit, and here, it will be observed, there is no distance at all, and this is just one of the scenes in which photography succeeds best. Mr. Green's "Head of Buttermere" (236) is very soft and aërial in effect, but as in many of these soft and rather misty views, the sky is lost, or only seen in faint and uncertain indications of cloud forms. One must except also the water from the foreground of "Cottages at Steventon,"—water appears to be in every case and under all circumstances a failure in photography. We have not found one successful example in this collection. Smooth water, giving much reflected light, becomes woolly in texture and loses all hint of water; rough water looks only like a dry, wrinkled surface. Instantaneous renderings of breaking waves or surf, as in "A Ground Swell" (462), by Mr. W. P. Marsh, show the sensitiveness of the modern plate, which can catch a wave actually on the curl, but as a representation of water it is valueless, almost disagreeable to look at, except solely as a business record of facts of form, which a sea-painter may perhaps find useful to refer to. Among other landscape subjects which are successful may be mentioned the two platinotype photographs "On the Thames" (425), exhibited by the School of Military Engineering, the lower plate especially: two by Mr. F. M. Sutcliffe (548, 549), the first a fine little scene carefully chosen for effect,—two trees on a ridge of down near the foreground, and a cloudy evening sky behind, a photograph into which something like poetic feeling has been conveyed; "View of Moel Wyn from Festiniog" (535), by Mr. C. E. Nesham, in which the large extent and aërial perspective of the hills is finely reproduced, though the sky seems to have been lost; "The Lea at Ware" (552), by Mr. Edgar Clifton, a carefully-chosen subject, with an old barge in the foreground,—artistic feeling is shown here in the choice of subject and point of view, at all events; "Dunluce Castle" (219), by Mr. Vernon Heath, of which the same may be said; and "Carolling," by Mr. H. P. Robinson (40), a landscape with two figures walking through fields, in which the landscape has really the softness and distance of a water-colour painting, but we imagine this has been touched upon and is not pure photographing work.

The figures in this last, however, jar upon the sentiment of the scene; they are supposed to be two rustic women singing as they go through the field. Mr. Thorne Waite or Mr. Tom Lloyd would have made a couple of expressive figures of them, in harmony with the feeling of the landscape; here we are brought down to the plain prose of commonplace everyday life, and the result is a total failure. The study of this and of a good many other photographic subjects compiled with similar aims is very instructive. It shows what we owe to art and artists in the production of the rustic idylls which form such a prominent and such a generally beautiful portion of our water-colour exhibitions. The photographers are very fond of trying to do the same thing, and the failure in most instances, where the picture is simply a direct chemical transcript from nature, is complete and in many cases almost ludicrous. "A Pretty Hop-picker" (63) seated on a stile is not pretty a bit; her face is a dead dull blank. Mr. J. Gale shows some cottage or rural scenes with figures,—the most successful being "Saturday Afternoon" (249), where he has been rather fortunate in his figures, and the broad mass of light on the white cottage is a good piece of effect. In others, such as "Too Wet for the Woods To-day" (245), the figures of an old woman leaning over the gate and a man coming up to it are simply vulgar. We can fancy what Mrs. Allingham would have made of them; and the same thought occurs in reference to "St. Catharine's Hill, Guildford" (61), a charming nook of landscape with a little girl seated in the midst of it just in the spot where "the figure" is wanted,—it is all right so far; but the common, inexpressive countenance of the child spoils it; the artist's hand was wanting. So again in "The Secret" (553), by Mrs. Payne, a little girl and boy; a charming expression has been caught in the former, but the boy's face looks dull and sulky. Photography, in fact, gives in general the commonest and poorest expression of the countenance; the artist seeks out and gives the best expression; and there is the gulf between photography and art,—or at least a part of it; for the still greater and essential distinction lies in the delight we all find in creating ourselves, or in studying the creations of others. Photography merely copies; the artist,—even the most nominally realistic artist,—does far more than copy; and nowhere can this distinction be more clearly seen and more strongly felt than in studying the efforts of photographers to produce pictures of human life. "Home, sweet Home" (41), an interior by Mr. Lyddell Sawyer, is another, we might almost say flagrant, example; the little bunched-up figure of the child held up in its father's arms is capital, and would be worth the attention of a painter, but the figures and physiognomies of the parents reduce the whole thing to sheer vulgarity.

Among really successful figure scenes we may, however, mention the little sleeping child, "Tired out" (482), by Mr. R. W. Robinson, a perfect little picture just as it is.

In what has been with the public the great and popular function of photography, the taking of portraits pure and simple, there are some brilliant successes. Among these the three "Studies," by Mr. M'Leish (292) are admirable; the photographer has been fortunate in his subjects, but he has also known how to light the profile portrait of the beautiful young girl on the right so as to give the most brilliant and striking effect to it. A medal has been awarded to another series of large portraits by Mr. W. J. Byrne (283), but from the artist's point of view these are not so good as No. 292, and in particular in the centre figure of the girl's head, nearly life-size, the modelling of the mouth has been quite lost.

As on former occasions, architecture, which of all classes of subject lends itself best to photography and loses least by any defects of the process, is the least represented of any class of subject. There is a fine and remarkably sharp view of St. Paul's Cathedral (20) by Mr. J. Bracebridge Hilditch, which, considering that it is an enlargement from the original negative, is a triumph of clear definition. It has been touched upon here and there with white for high lights, but so obviously as not to constitute any deception. Mr. Richard Keene shows some "Interiors of Osmaston Manor" (4); Mr. W. Webster some interiors of "Eaton Hall" (21), Mr. Salmon has some good photographs from St. Bartholomew's and other City churches, Mr. T. M. Browning gives a good view of the Ponte Vecchio at Florence, and Mr. Bedford Lemere has been successful in producing some very elaborate interior detail from rooms in "Beau Manor" (92). Perhaps the most remarkable of all the architectural photographs for sharpness of definition are the two by Mr. Mold of interiors of St. Mary's Church, Banbury (189 and 432), a Classic interior which appears to have undergone recent decoration. Considering the difficulties in regard to light in interiors these may be called extraordinarily successful. But we should recommend the Society to pay more attention to architectural photography, especially of ancient works, in their exhibitions: there is no class of subject in which their work can show to more advantage or be of more value.

Among the curiosities of the exhibition is an architectural curiosity also, a photograph of a real contemporary series of lake dwellings, in full occupation, at Tupuselai, in New Guinea (404). Any architect visiting the exhibition would find it worth while to look at this. There are various photographs of flashes of lightning (but these are getting common now); photomicrographs of minute objects from plant and insect life by Mr. F. H. Evans, for which the exhibitor has received a medal; the photograph of the claws of the house-spider, magnified 240 times, is one of the most remarkable and successful of these. Mr. G. W. Webster has somehow succeeded in photographing a couple of skylarks and their nest, the one bird on the ground, the other just hovering down; how he managed to get so close to the birds as to secure the photograph without frightening them away is the marvel; but the bird in flight illustrates one of the weak points of instantaneous photography; the bird's wings seem stationary, just as in the case of the instantaneous photograph of an express train which we noticed on another occasion: all idea of motion is taken away, wheels and wings alike are stopped dead. Mr. Sidney Tebbutt shows a photograph taken on a moonlight night in Saxony,—"full moon and cloudless sky, exposure three hours, from ten p.m. to one a.m."; but here again photography fails,—it conveys no idea of moonlight: the lens, in fact, sees more than the human eye can, and as we mentally refer to our experience from actual vision, the photographic result appears false, though in a scientific sense it may be true enough. On the whole, the more we study photography, the more we feel how far removed is real art from mere imitation of nature; how much of the pleasure we derive from painting springs really, unknown perhaps either to spectator or artist, from that expression of the artist's own mental mood, and that sympathetic response to it in the mind of the spectator, which mere photographic reproduction is powerless either to express for the one or to awaken in the other.

NOTES.

THE paintings by M. Verestchagin at the Grosvenor Gallery are somewhat of a disappointment, not from any want of power, for there is plenty of that, but from the prevalence of mere big realistic war pictures, mingled with what may be called stage effects. The latter element is certainly predominant in the three big canvases grouped under the title "The Forgotten Soldier," the first showing a cold snowy mountain range with a vulture hovering; the second the vulture in progress downwards through the intermediate mists; the third the dead soldier and the vultures in congress. The snow picture is fine, but there is nothing in it to compensate for the size of the canvas employed. The battle scenes are of genuine interest in their way, but it is the interest of realistic description, not of artistic treatment. Among these one of the best is "Before the Attack" on Plevna (79), with the unfortunate soldiers huddled on the ground on a wretched rainy morning, preparing to tramp through the mud and be shot on the way to the ramparts in the distance. This and various other works of the same kind give a vivid idea (or we should imagine so) of the gross realities of war with the tinsel taken off; and from M. Verestchagin's method of treating them, and from some stray remarks in the catalogue, we gather that this is his intention, and that he is in fact a kind of Erckmann-Chatrian in painting. In a kindred spirit he places alongside each other three large paintings of executions; in the centre one of crucifixion under the Romans, on the left a scene showing English troops blowing some Indian scoundrels from the guns after the mutiny, and on the right an execution by hanging in Russia, a thick snow falling and a row of gallows dimly seen through it. This is a double cut, we presume, at English and Russian barbarity. There may be various opinions on the *morale* of the subject, which it is not our business to go into; but it is not the kind of thing one goes to an art-gallery to see. Our remembrance of some earlier works of M. Verestchagin's led us to expect something different from this. Among the small paintings are some beautiful little things, especially some interiors of

Indian palaces, and two views of the Taj at Agra, from the gardens, in sunset and in early morning light, which are delightful. A large interior of "the private mosque of the Great Moguls at Delhi" (95), shows M. Verestchagin as an exceedingly fine draughtsman of architecture on a large scale; though here again the canvas seems on a much larger scale than the subject really requires. The exhibition is well worth seeing in its way, but one cannot help regretting that a painter of M. Verestchagin's talents should have devoted himself so much to this merely realistic illustration of painful scenes. He might have done higher things than these, with his powers.

THE interests of the Panama Canal Company will not be materially advanced by the advocacy of writers who are either hopelessly ignorant of the A B C of engineering, or presume on an equal amount of ignorance on the part of those whom they address. The well-known Paris correspondent of the *Times* leads the van of this kind of advocacy. He is good enough to explain that "what was done at Suez will be done at Panama. The canal at first will not be made either of its full depth or full width, but will be navigated by large vessels before it has been entirely completed." This sounds very plausible to those who think that one canal is as good as another. But the simplest calculation shows the absurdity of the statement. In the Suez Canal, over the course of which but one hill worth notice occurs, the excavation below the water-line, on the original section, was very nearly equal to the excavation above it. By halving the width a temporary reduction of about 22 per cent. was effected in the bulk of the excavation. The Panama Canal, according to its published section, has a bulk of 21 millions of cubic mètres to be excavated below the water level, and of 110 millions of cubic mètres above it. To halve the width of the canal would thus make a most insignificant reduction in its cubic contents, as the slopes must be the same whatever be the width of the water-way, and a mere vertical slice of 11 mètres is all that would be for the moment left uncut. The great problems of the 360 ft. of cutting, and of the disposal of the 40 ft. floods of the Chagres, would remain unaffected by the reduction of width. The effect of leaving in one or two mètres in depth at the bottom of the canal would be hardly appreciable in figures of such colossal magnitude. Matters must be in a bad way if advocacy of this kind is sanctioned by M. de Lesseps.

THE new number of the Statistical Society's *Journal* contains an excellent article on the Mortality of the Troops serving in the United Kingdom from Consumption, by Dr. Lawson, Inspector-General of Hospitals. Of course, on such a subject there is much that is retrospective; but it is very encouraging as showing us the great improvements between 1862, the date of the alteration, and now. Ventilation was at a particularly low ebb in barrack life in early days. In a report of 1861 upon 162 barracks containing in the aggregate 5,339 rooms, giving accommodation to 75,801 men, on the basis of 600 cubic feet for each man, the Commissioners recommended that the number of tenants should be reduced to 53,806 men. In 82 barracks, told off for 42,589 men, there were no means of ventilation provided; in 78 others the means were deficient, and what there were acted inefficiently; and in only one barrack was the ventilation as could be wished. Tommy Atkins, if he had known it, might well have founded a grievance, that he was not allowed that cheapest of all God's blessings, fresh air. Of course, improved ventilation was not the sole agent in lessening the mortality of phthisis, but it was a very important one, and one that was of particular interest to all those who were concerned in the erection of public buildings. The author also speaks well of what may be called rural barracks or camps, such as Aldershot, the Curragh, Shorncliffe, &c., in which the men get the advantage of country air to a much greater degree than those who are penned up in town barracks.

BY the death of Mr. Grierson, which occurred on Friday last, the Great Western Railway Company lose a most energetic officer, and the railway interest an able and powerful champion. The deceased gentleman had only been seriously ill for a very short time, and the announcement of his death caused general surprise and regret. The chief of the executive of a system which has, by the absorption of other lines, acquired a greater mileage than any other railway in this country, must necessarily be a man of varied attainments, and the late General Manager of the Great Western was eminently fitted for the position. He had, during the long period of his connexion with the Company, successfully overcome much opposition, and surmounted many obstacles; and he had no inconsiderable share in bringing the line to its present satisfactory position. His book on "Railway Rates, English and Foreign," which was published last December, is one of the most important that has appeared on this subject, and bears evidences of very careful research and far-extending inquiry. As its professed object was to refute some of the charges just then rather frequently made against railway companies, the work is naturally somewhat biassed, and not altogether free from errors of detail and incorrect conclusions. At the same time the public are indebted to Mr. Grierson for a great deal of very useful information, and the railway interest for a fund of powerful and ingenious argument, and his loss will be felt on all hands.

IT is announced that an "apprentices' exhibition" will be held in the People's Palace in East London, the object being "to encourage the old apprenticeship system, which is generally admitted, to the detriment of English industry, to be gradually dying out." All boys and girls who are serving their time as bound apprentices within the metropolitan area of London will be qualified to exhibit, and the Committee will be prepared to consider any special cases of boys and girls who, though not legally indentured, are *bonâ fide* serving an employer for a fixed term of years, for the purpose of learning a trade, within the same area. Every exhibit must be the genuine handiwork of the exhibitor. The list of the Council includes the names of Professor Huxley, Sir Henry Roscoe, Sir W. Hart Dyke, and Sir Lyon Playfair. The exhibition will be opened on December 19th. It is an excellent move, and we hope it will be a success: it can hardly fail to be of considerable interest.

DR. ALFRED CARPENTER writes to the *Times* to call attention to the state of the River Cam. He says:—

"During the past four years it has been my privilege to assist at the examination of candidates for the diploma of public health which is now granted by the University. In each succeeding year I have seen unmistakable signs of an approaching catastrophe unless the local authorities do their manifest duty at an early date. The odours given off during the past week from the bed and borders of the stream between Trinity boathouse and Stourbridge-green, and even down to Fen Ditton, were very alarming to me, and had I sons at the University I should, for their sakes, positively prohibit boating on the river."

Dr. Carpenter goes on to warn the local authorities against trusting to disinfectants, and that the only safe course is to put the sewage on land instead of putting it into the river; but as it is supposed by the Board of Works that the sewage of London is to be successfully treated with disinfectants it is improbable that Dr. Carpenter's words will persuade the Cambridge authorities that their much smaller aggregate cannot be treated in the same manner. Dr. Carpenter assumes that the University authorities have no jurisdiction or cannot get their wishes attended to by the town authorities, and that otherwise this state of things could not possibly be allowed to continue; but he should not be too sure of that. Men may be very learned in the higher mathematics without understanding the simpler problem of sanitation, and possibly the Dons do not go on the river much. If it is in the state which Dr. Carpenter describes the rowing men are certainly to be doubly pitied. It is bad enough to be condemned to row on a river about as wide as Bond-street and with no depth or weight of water, but if even this amount of water is largely mixed with sewage the Cambridge undergraduates might well felicitate those of Harvard on the superiority of their river accommodation, as they are reported by our friend *Punch* to have done in choice Latin: "Vos estis diabolice fortunati: noster est bestia fluminis."

THE Milan correspondent of the *Courier de l'Art*, commenting on the conditions for the second competition for the new façade to Milan Cathedral, observes that no directions have been given and no opinion expressed in the conditions as to whether the façade should have five portals or only three, or whether there should be flanking towers at each side of it, "selon le système ultramontain"; but adds that, after the result of the first competition, every one seems to be of the mind that the towers are not necessary to the success or completeness of the project. He goes on to observe that one clause in the new conditions seems to imply that the premium will be withheld from any one who sends in a design out of keeping with the style and "organism" of the existing building; that this very proper restriction was, however, laid down in the conditions of the first competition, and was practically ignored by the jury, since they selected among the fifteen a design in the style of English Gothic of the thirteenth century, and have therefore no right to take up a new position in the matter now. It is certainly the case, as we noted at the time, that the first conditions required the competitors to conform to the style of the existing building, and in that case they certainly should not have selected a design "in the English style of the thirteenth century"; but if they selected the design referred to because it evinced genius, and if they at the same time make it clear to the designer of the same that he must modify his design into conformity with the style and period of the existing building, they will place themselves in the right for declining the premium if the architect neglects their intimation.

AS a rule the *Museo Italiano di Antichita Classica* concerns itself chiefly with questions of epigraphy and the like, interesting only to the specialist. In a recent number, however (ii. 1), the editor himself, the well-known scholar and archæologist, Sig. Comparetti, gives us a paper of very human interest. He has collected together all the known instances, six in number, of representations of Sappho in vase-painting. It is a familiar fact that vase-painters do not represent historical personages unless under very exceptional circumstances: we look in vain for Solon, or Pericles, or Demosthenes. If a historical person wants to be perpetuated on a vase he must contrive to gather round him a halo of mythological romance. So it was with Sappho. She was the tenth Muse, and as such was nowise out of place in the cycle of mythology. Ovid (if the epistle be genuine), among the purely mythological heroines he addressed, included Sappho. It would be impossible here even to enumerate all the interesting points as to literary tradition, artistic treatment, and notably epigraphy, to which, in connexion with these vases, Sig. Comparetti calls attention. He gives plates of five out of the six. Three have been published before, and are here reproduced for comparison. Two appear for the first time. They each have special interest,—one, from the little known collection of the Countess Dzialinsky, is the earliest representation of Sappho we have: the design, though red figured, is quite archaic in manner. The other is indisputably the most interesting of all the Sappho vases. Sappho is seated, surrounded by three of her women disciples. She is reading intently from a roll, on which can clearly be made out a dactylic line of halting scansion from one of her own poems:—

θεοὶ ἠρίων ἐπίων ἄρχομει ἄλλων.

A famous Cambridge scholar (of anti-archæo-

logical prejudice) was once heard to say he "would give all the Greek pots that were ever discovered for one new fragment of Sappho." One of the despised "pots" has returned him good for evil. The existence of the vase has long been known; it is only surprising that a piece of such exceptional interest has so long escaped publication.

MR. W. THOMPSON WATKIN writes to us that the Roman tesselated pavement at Tockington, which last week we described (p. 487) as having first been found in 1884, was discovered as far back as 1785, and that in Seyer's "History of Bristol" (vol. i., p. 203), published in 1821, it is thus referred to:—"We have one pavement of this kind nearer to Bristol, at a place now reduced to a farm-house, now called Tockington Park, eight or nine miles distant on the right-hand as you go to Gloucester. It was discovered about A.D. 1785 in the farm-yard, not more than a foot under ground, and a large quantity of dung lay over it, on removing which some part of it, about a yard square, was laid open. The tesseræ were rather larger than they are generally found, formed into a pattern as usual. Very little notice was taken of it and it was soon forgotten; the number of foundation walls around it make it highly probable that this is the site of a Roman villa as yet unexplored." "The discoveries in 1884 were some more fragments of tesselated pavement and the base of a column or pedestal." We shall have further information to give on the subject next week, after visiting the site.

THE collection of Greek and Roman sculpture now arranged in the old print-room (a place quite unsuitable to and unworthy of the collection), and consisting, to a great extent, of funereal and monumental bas-reliefs and tablets, which have been long hidden out of sight in cellars, is a most interesting and valuable addition to the classic antiquities department. Among the Greek work are one or two very fine grave-reliefs, of the class to which we called some special attention a short time since; and there are some fragments in the collection which are interesting in an architectural point of view. One cannot help being struck by the remarkably "Renaissance" look of some of the Roman work, indicating that some of the early Renaissance sculptors were more direct imitators and reproducers of Roman work and Roman feeling than has been fully recognised. The reliefs of children in one or two examples are very like the work of Luca della Robbia, and the heads of Antistius and Antistia, a Consul and his wife, in high relief, beneath scalloped canopies, are things we should have expected to find in the Florentine Court at South Kensington. These heads are obviously portraits, and that of the Consul, with his mean physiognomy and abnormally large ears, shows what a low type of man could succeed in securing this convenient and often lucrative post under the Empire. We may have more to say about the collection.

DR. FURTWÄNGLER thinks that he has identified as an original work from the hand of Praxiteles a beautiful marble head now at Athens. The head was found at Eleusis, and was published in two phototype reproductions in the Ἐφήμερις Ἀρχαιολογικὴ (1886, pl. 10). It will now, of course, attract a great deal of attention and controversy. It represents a youth with long heavy hair, confined by a simple band, and the expression is certainly tinged with that gentle contemplative melancholy which we are accustomed to associate with Praxiteles. If Dr. Furtwängler's surmise be correct, we have a head not only of great interest, as coming from Praxiteles, but also one the subject of which is both novel and important. He thinks the statue, of which the head only remains, represents Eubouleus, a somewhat shadowy personality, of whom we should be glad to know more. Some mythologists make him the brother of the arch-Eleusinian ploughman, Triptolemos; others say he was the swine-herd whose swine were swallowed up in the earthquake that accompanied the rape of Persephone. Anyhow, he is a personality closely bound up with the worship of the two dread goddesses at Eleusis. The worship is authenticated by several inscriptions. It is known from an inscription on a Roman copy that Praxiteles made a statue of Eubouleus, and presumably it was executed for Eleusis. The paper, which is of great interest, is reported in the *Philologische Wochenschrift*, Oct. 8.

THE authorities of the Berlin Museum have just issued (for sevenpence) a little book which, though it is in intent a guide-book to the Pergamene marbles, should be of much service to all students of ancient art. It gives a brief but very complete account of the whole course of the excavations, and has two plans of the city of Pergamos as it is now laid bare. As few persons ever consult and still fewer possess the magnificent illustrated work which the Prussian Government is in course of publishing on the excavations, this little book supplies a real need for the general public.

THE birthplace and early home of Dr. Johnson, which is to be put up for sale at auction in the course of next week, stands over against the place of his baptism, St. Mary's Church,—since rebuilt in memory of Bishop Lonsdale,—and has a return frontage to the Market-place, Lichfield. Facing the house is his statue, by Lucas; whereof one piece of sculpture commemorates Johnson's penance in the market of Uttoxeter. The house was built, as his own freehold, by the father, Michael Johnson, a native of Cubley, Derbyshire, who for some while of his career as a bookseller enjoyed no mean repute among his fellow citizens. But suffering reverses of fortune he had nothing to leave at his death (December, 1731), except this house to his widow, and a few pounds for his sons, Nathanael and Samuel. Here the latter was born on September 18 (new style), 1709. It formed his home, perhaps, until his unsuccessful venture in opening a school, in 1736, at Edial Hall, near to Lichfield. Meanwhile, he had been in residence for fourteen or fifteen months at Pembroke, Oxford, had served as usher at Market Bosworth (1732), and had sojourned a few months at Birmingham. In March, 1737, Johnson came up to London, and, after a return for three months to Lichfield, brought his wife to town in that same year. Michael Johnson had added to the house: this entry is made in the civic books:—"1708, July 13. Agreed, that Mr. Michael Johnson, bookseller, have a lease of his encroachments of his house in Sadler's Street for forty years, at 2s. 6d. per an." That lease was subsequently renewed to the son by the Corporation, and without fine, in token of their respect for his character and eminence. In the codicil dated December 9, 1784, to his will, Dr. Johnson devises, in trust, to his executors for sale or disposal "my messuage or tenement situate at Lichfield . . . . with the appurtenances in the tenure and occupation of Mrs. Bond . . . . or of Mr. Hinchman, her under-tenant." Edial Hall was pulled down about eighty years since. A view of it from a sketch by J. T. Smith, together with one of the Lichfield house by E. Finden, after Clarkson Stanfield, R.A., were reproduced for Croker's work.

AT the meeting of the Metropolitan Asylums Board last week, Sir E. Galsworthy, the Chairman, criticised the requirements of the Local Government Board as to the "temporary" character of the hospital buildings to be erected at Darenth or elsewhere. If, he said, the buildings were to be of brick, and the managers had approved of brick and rejected wood, as objectionable, dangerous, and, in the long run, as very expensive, they must necessarily be of some permanence. Dr. Bridges said that with regard to the alleged ambiguity as to "temporary" buildings, he meant by this that such buildings only should be erected as might be pulled down, and suggested that the one-storied brick huts at Hampstead might serve as a model of what could be done at Darenth. But why not try Lascelles's concrete cottages? Those seem just the kind of thing for the purpose; inexpensive, capable of being made warm enough, easily put up at short notice, and easily removed. The discussion seems to have been carried on as if there were no way of building but with bricks.

WHETHER the Royal Institute of Water-Colour Painters will much advance the cause of art by their Art Union is somewhat doubtful. They will distribute a certain number of good drawings and engravings, which will fall into the possession of a large number of persons who will care very little more for art in consequence. The love of speculation rather than of art is the main motive which induces most persons to subscribe to a lottery of this kind. Those who desire to beautify their homes can already do so at a low cost by the purchase of the publications of the Autotype Company, and the numerous etchings and engravings which are within the reach of any one who can afford to spend a pound or two on art. The Institute would do much more to advance the love of art by having small exhibitions of really good water-colour drawings in some of the suburbs of the metropolis, and in small towns where there are no opportunities of studying art, than by the lottery which they have just established.

A CORRESPONDENT, who signs himself "A Victim," writes to the *Times* to tell how he and other persons at Gotham,—we beg pardon, Worthing,—have been cruelly taken in. A man calls at the houses, evidently selecting the time when the nurse is out, and there is no one to take proper care of the inmates, and begs to fix gas-burners, at 2s. each, which will save 50 per cent. of the gas. He is so persevering that they cannot resist his blandishments, and allow him to fix burners all over the house, which are discovered afterwards to be another number of the same class of burner that has been removed, by the same makers, and to be purchased at 3d. each, and which consume more gas than those removed. The "Victim" adds that it would be an interesting and profitable employment for the readers of the *Times* to calculate the amount of profit made by the traveller who thus takes in the unsophisticated inhabitants of Worthing. We do not see where their interest and profit will come in; but there is a certain kind of pathetic amusement to be derived from the contemplation of a person, apparently able to read and write, and therefore with some sort of education, allowing himself to be taken in by so transparent a hoax, and then solemnly warning the public through the newspapers, as if all the rest of the world were as silly as himself. Next time the "Victim" is taken in (we can hardly suppose that so suitable a subject for simple frauds will be long overlooked), and writes his account of it to the papers, he had better sign himself "A Simpleton"; and if any more bogey men with wonderful gas-burners call, he should ask nurse before he buys them.

NOTES AT THE EXHIBITION OF ECCLESIASTICAL ART AT WOLVERHAMPTON.

FROM the point of view of lovers of art and history it is very much to be regretted that the annual exhibitions connected with the Church Congress are so much better supported by manufacturers of church furniture, plate, and decorations than by those who possess ancient, beautiful, or curious objects which they might lend to swell the interest and importance of the "loan collection" that always forms one feature of the show. Manufacturers cannot be blamed if, seeing that the exhibition depends almost wholly upon them, they insist upon the best light and positions for their stalls, and force the ancient church plate and rare embroideries to take refuge in dark little back rooms, as last year, or in a poorly-lighted basement, as on this occasion. Surely, among the possessions of the multitude of highly-cultivated men,—chiefly clergymen,—who take part in these Congresses, enough of interest might be found to fill a moderate-sized room, such as was this year

devoted to the collection, without including what is but very remotely, if at all, connected with ecclesiastical art, and without finding it necessary to fill up with photographs and modern manufacturers' specimens which, however beautiful, are quite out of place in such a collection. We fear that the position which the objects on loan year after year occupy, and the smallness of their number and interest, must act and re-act on one another. Few care to take the trouble and risk of lending their treasures only to find them put in a dark corner of a cellar; yet, if the treasures are few and insignificant, their claims are overlooked or set aside. Who will be the first to put these loan collections on a better footing, their patrons or the management?

Among the most striking objects to be seen in the cases this year was a silver crucifix, fig. 1,

Fig. 1.

which appears to have once formed part of a processional cross. The thin silver plate which forms the background has evidently been fixed to woodwork, the holes for the nails or screws still showing. The extreme dimensions of the fragment are 11§ in. by 8 in. The figure, of rude workmanship, with long body and short legs, but expressive features, is in high relief, and has been much battered out of shape in parts,—it, with the cross on which it hangs, still bears traces of gilding. The nimbus is of *cloisonné* enamel, red and blue. The treatment suggests a very early origin. In the same case were a number of chalices and patens, most of them very skilful imitations of ancient originals; others, some of which appeared and were illus-

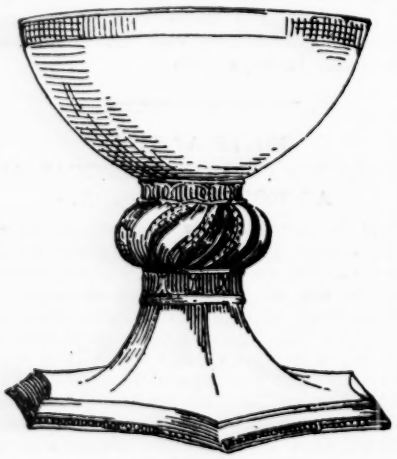


Fig. 2.

trated by us last year, were the originals themselves. Among the latter, No. 257 was an elaborate and rather large chalice, with some pretty fifteenth-century architectural detail, but poor in outline. The chalice and paten belonging to Hamstall Ridware Church, Staffordshire, figs. 2 and 3, are well-known specimens of præ-Reformation church plate, and the silver paten, No. 56, from Cofton Hackett Church, fig. 4, is one of the only two præ-Reformation patens to be found in the county of Worcester, the other being in Worcester Cathedral. It is 5¼ in. across, very thin; and the workmanship, which is of the most primitive description, is beginning to be obliterated by constant polishing. In the same case was an old pewter flagon, fig. 5, formerly used in Whittington Chapel, Worcestershire; it measures exactly 8 in. in height to the lip, and is a good specimen of a number of similar vessels that once served to hold the sacramental wine in a large number

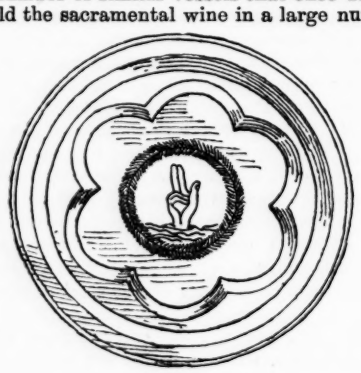


Fig. 3.

of churches, and still serve the same purpose in a few places. In another case are to be seen several ivory caskets and other objects of some interest, lent by Mr. David Jewell and other gentlemen, among which we noticed a brass Russian Icon of the ordinary design, somewhat similar to a smaller silver one which

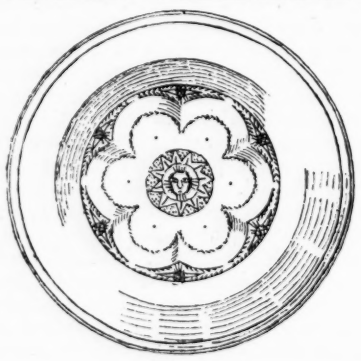


Fig. 4.

we illustrated last year. The largest of the ivory coffers was a good specimen of fifteenth-century German workmanship carved with several series of figures of saints. In the same case we noticed a small ivory diptich of fair workmanship, and six grotesque heads carved in ivory, said to be caricatures of the Popes,

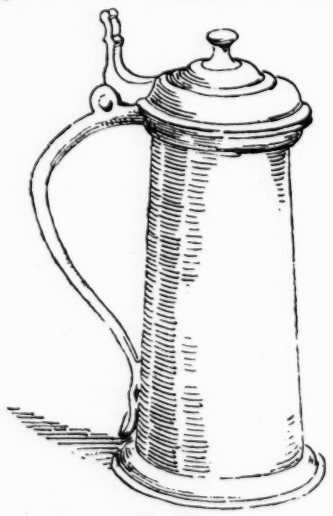


Fig. 5.

full of genial humour. Conspicuous at one end of the room hangs an old Italian church banner, elaborately embroidered in gold and colours on white silk, it is now sadly faded and torn. In the centre is an Assumption of the Virgin, and at the foot a representation of a scene which is a little inexplicable: three flames or fires seem to be rising from a lake whereat a cow on the bank sinks on her knees, while the herd falls backwards in astonishment, and a town to the right of the picture collapses into ruins. The workmanship of the banner is very beautiful, but the design is wild and coarse. At the side of the room, and lent by the same exhibitor, the Rev. A. R. Harrison, is a beautiful piece of silk embroidery worked in delicate tones, on cream-coloured silk. It seems to be the centre portion of an Italian altar-cloth. The centre is occupied by a cross on a gilt ground, surrounded by an oval garland of flowers. The field is occupied by flying birds, and the upper border consists of swags of flowers supported by birds. The charm of the work lies in the delicacy of the drawing and colour. Close beside this exhibit hangs a beautiful drawing of Prior Cranden's Chapel, Ely, by Mr. W. H. Bidlake, M.A.

Mr. Cecil Harcourt Smith has lent a number of Persian and Eastern fabrics of various kinds, carpets, shawls, and cloths, some of which are very lovely; the patterns are chiefly geometrical or arrangements of conventionalised foliage and flowers; in fact, what the patterns of Persian and Eastern stuffs generally are,—exquisitely designed, drawn, and coloured, but past describing in detail. We particularly noticed No. 25, a large hanging or quilt of yellow silk, embroidered with birds and flowers; Nos. 9 and 12, fabrics of cloth of gold, and No. 13, scarlet silk, with a small sprinkled flower pattern.

Messrs. Doulton have lent Mr. Tinworth's terra-cotta of "The Prodigal Son," and several smaller works by the same artist. In the former the prodigal is the centre figure, seated on a stool, his hair and beard unkempt, looking down and away from his father, who stands holding the hand on which he is about to place a ring, which he is taking from a child who runs to him with it. On one side a kneeling slave places shoes upon the feet, which he has just washed, and on the other a female brings the new robe. The elder son appears through the lattice from outside, pointing to the fatted calf which is being brought in at the door. The composition is completed by the introduction of figures gathering the grapes that hang from the lattice roof, children, and musicians.

Messrs. Jones & Willis have lent some very beautiful vestments and altar frontals.

Upstairs the most beautiful exhibit is that of the "Autotype Company," consisting of exquisite reproductions by their photographic process of pictures and drawings, among which are conspicuous the Sistine "Madonna," Da Vinci's "Last Supper" (from the engraving), Rubens's "Assumption," Francia's "Pieta," Reynolds's angels' heads, Sir Frederick Leighton's S. K. frescoes of "Manufacturing Art as applied to Peace and War." Near these are Messrs. West & Collier's church chairs, a varied collection of useful specimens. The largest room is chiefly devoted to church furniture, stained glass, &c. The chief stalls are occupied by Messrs. Jones & Willis and Messrs. Benham & Frond, Limited, who both show some good metal work in lecterns, lamps, altar furniture, &c., and some beautiful embroidered altar frontals. Messrs. Jones & Willis show several specimens of church furniture in oak, notably a pulpit of better design than is generally to be found in manufacturers' pattern-books. Messrs. George M. Hammer & Co. exhibit a large quantity of cheap church and school furniture and fittings, which will meet the demands of those who have little to spend. Messrs. Mayer, of Munich, have sent several specimens of stained glass, which, though it may tend to counteract the just prejudice of many persons against Munich glass, will probably still be too opaque for modern English taste. On the staircase are some beautiful cartoons for stained glass, and one fine specimen of such work by Messrs. Ward & Hughes.

In one top room are a wrought-iron chancel screen for a Lichfield church, and some wrought-iron panels, very well executed by Mr. Culwick, of Lichfield. Here that doubtless useful body, the Religious Tract Society, also has a stall, and here it visibly justifies its connexion with ecclesiastical art by hanging upon the walls the most atrocious coloured prints, illustrative of the second part of the Pilgrim's Progress, that were probably ever executed. In the same room Messrs. Beal & Co. show some specimens of altar furniture, embroidery, &c. In the large room the "East Grinstead School of Embroidery" have a collection of some of the best embroidery in the exhibition. We noticed particularly a gilt stole with a figure of St. George on one end and a white damask chasuble with gold embroidery. The Decorative Needlework Society also shows some very good embroidery, and the Arundel Society some of its finest plates.

THE CONDITION OF THE THAMES.

Mr. Ramsay, Surveyor to the Twickenham Local Board, has prepared and submitted to that authority a detailed report on the present condition of the Thames between Teddington and Richmond. The causes of that condition and the suggested remedies are dealt with at considerable length by Mr. Ramsay. The removal of Old London Bridge, with its narrow arches, is regarded as one of the chief causes of the scarcity of water in these parts of the river. It appears that before the removal of that structure in 1823 the low-water mark at Richmond was 6 ft. 3 in. below Trinity high-water mark. In 1860, however, the low-level mark at Richmond had fallen to 7 ft. 7 in. below Trinity high-water mark, while in 1887 it has fallen to about 9 ft. 6 in. Even at Teddington the low-level water-mark has fallen from 2 ft. in 1823 to nearly 7 ft. in 1887 below high water at Trinity. The old bridge acted as a dam, and between that and Blackfriars Bridge the soil was silted up to such an extent that active dredging operations had to be constantly carried on between the two bridges. Dredging operations subsequently to the erection of the new bridge have also tended to lower the water-levels of the river from Teddington Weir to Westminster. By the removal of shoals which prevented the water from flowing freely down the incline or bed of the river, the motion of the water has been quickened, and it runs away in a shorter time. It is pointed out that the low-water level at London Bridge in 1823 was 14·40 ft. below Trinity high-water mark. It was reduced by the removal of the old bridge and dredging operations to 20 ft. in 1865. Mr. Ramsay lays considerable stress on the abstraction of the large quantity of water from the river by the various water companies as a circumstance contributing greatly to the scarcity of water in the upper reaches of the Thames. It is curious to note that the maximum aggregate quantity (110,000,000 gallons daily) which the several companies are permitted by their Acts to draw from the river, is about half the quantity which passes daily over Teddington Weir during the dry period of the summer season. Mr. Ramsay naturally enough argues that a further extension of power to the water companies in the direction of enabling them to draw a larger supply of water than they can obtain at present from this source would be an unwise proceeding. He asserts that the dredging operations in the Upper Thames recommended in 1873 by Sir John Coode and Captain Calver, have so far not been attended with the anticipated results. The object in view then was to deepen the channel between Teddington and Richmond Bridge, so as to give a uniform depth of 3 ft. 6 in. at low water of spring tides, and a bottom width of 100 ft.; the banks to slope uniformly to the extent of 4 ft. in one, and provision was made for making an even high-level mark, by topping the irregular banks with the gravel produced in the dredging. This uniform depth was planned on the assumption that the water companies abstracted daily their maximum quantity of water, namely, 110,000,000 gallons. But it is pointed out that the effect of the dredging to make the channel the prescribed width of 100 ft. has been to lower the water level within the Richmond and Twickenham district, rendering navigation, even for pleasure-boats, almost impracticable at low tide, and exposing the unsightly muddy banks. It is admitted, however, that the formation of uniform slopes made from the banks of the river along the Surrey side is in itself a great improvement. They will when completed not only tend to improve the river for navigation purposes, but will materially reduce the large amount of sediment which is continually being washed from the ragged banks and deposited on the foreshores. Another cause assigned for the scarcity of water in the Upper Thames is the rapidity with which storm water, owing to the extension of modern systems of drainage, flows into and passes out of the river. In order to preserve this storm water for the benefit of the Upper Thames, Mr. Ramsay suggests that a number of reservoirs should be constructed at the mouth of the tributaries of the Thames, where the stored-up water could be let into the river when it was wanted. Mr. Ramsay is in favour of a lock and weir between Teddington and Isleworth as a means of restoring the navigable condition of the Upper Thames either for trade or pleasure. He deals at length with the various objections, official and otherwise, which have been advanced against a lock and weir,—such as the depositing of mud in the region of the still waters created by the structure; the aggravation of this evil by the discharge of numerous sewers and drains into the river above the site of the proposed weir; the withdrawal of 15,131,000 cubic feet of tidal water, which at present operates in maintaining the channel by its scourage; and lastly, the delay to barges. The objections as to the withdrawal of the tidal water and possible flooding, can, Mr. Ramsay asserts, be met by dredging the river between Putney or Barnes and the proposed lock, where "some deposition of mud and silt would inevitably take place." As the proposed lock and weir would be half tidal, silting above the lock was not to be feared, as only a small proportion of the matter in suspension would pass over it after the waters had reached the height of half tide. Considerable scavenging powers may be arranged for and secured in the structural arrangements of the weir, by which the whole tidal column may be permitted to pass through on the ebb until it reached the half-tide level, when the weir would be closed. As to the discharge of sewers and drains into the basin above the weir, Mr. Ramsay thinks that the objection may be practically dispensed with, from the fact that the whole of the sewage in the district above the weir will, under schemes now approved or works already carried out, be intercepted from the river. The objection as to the delay which would be occasioned to the barges passing through the lock would be trifling compared to the delays which have to be undergone because of the impassable condition of the river, so far as barges are concerned, in the Richmond district. With a half-tidal lock the gates would be opened on the flood when the tide had risen 5 ft. on to the level of the top of the weir, and craft would then pass freely through the lock from that time until the tide had fallen to the corresponding level on the succeeding tide. Mr. Ramsay concludes his elaborate report by the observation that until the Metropolitan Board have fulfilled their duty as a sanitary authority, by intercepting the metropolitan sewer storm outfalls between London and other bridges, and improved the condition of their main sewer outfall at Barking, offensive sewage matter will always be deposited in the upper Thames.

ARCHITECTURAL ASSOCIATION
CONVERSAZIONE.

The Architectural Association commenced the session, as usual, with a *conversazione*, which was held at the Westminster Town Hall on Friday, the 7th inst.

The large hall, in which a reception was held by the President, Mr. John Slater, B.A., was devoted to an exhibition of art manufactures; and during the evening the band of the 2nd Life Guards played at intervals. Two chamber concerts were given in the Council Chamber, in which, under the direction of Mr. Malcolm Lawson, Miss Emily Lawson, Miss Isabel Tomalin, Miss Amy Hickling, Mr. D'Arcy Ferris, and Mr. Hubert Thorndike took part.

The prize drawings and the work done in the various classes were exhibited in four committee-rooms. During the evening the President announced the names of the prize-winners:—

Architectural Association Medal (Design for College Gateway).—Mr. G. G. Woodward.

Architectural Union Company's Prize.—1st, Mr. W. A. Webb; 2nd, Mr. H. P. B. Downing.

Architectural Association Travelling Studentship.—1st, Mr. A. H. Hart; 2nd, Mr. H. P. B. Downing.

Aldwinckle Travelling Studentship.—Mr. W. M. Duke.

Ernest Turner Prize.—Mr. H. C. A. Colville.

Blashill Prize.—Mr. H. E. Mallet.

Lectures on Architecture.—1st, Not awarded; 2nd, Mr. F. L. Jones; 3rd, Mr. V. T. Jones.

Lectures on Construction.—1st, Mr. H. S. Wood; 2nd, Mr. H. G. Lidstone; 3rd, Mr. H. V. Lanchester. Honourable Mention: Mr. A. B. Yeates, Mr. H. Ermrich, Mr. H. E. Mathews.

Class of Colour Decoration.—Prize, Mr. W. Dewes. Honourable Mention: Mr. H. V. Lanchester.

Class of Design.—1st, Mr. C. E. Bateman; 2nd, Mr. H. R. Applebee; 3rd, Mr. E. W. Monro.

Elementary Class of Design.—Section I.: 1st, Mr. R. D. Warry; 2nd, Mr. A. W. Jarvis; 3rd, Mr. H. Woodington. Honourable Mention: Mr. A. B. Yeates. Section II.: 1st, Mr. A. W. Cleaver; 2nd, Mr. J. Ellwood. Honourable Mention: Mr. D. J. Blow, Mr. R. A. J. Bidwell.

Advanced Class of Construction.—Mr. J. C. Agutter.

Class of Construction.—1st, Mr. W. D. Gravell; 2nd, Mr. F. R. Oglesby.

Elementary Class of Construction.—1st, Mr. H. Ermrich; 2nd, Mr. A. W. Jervis and Mr. L. V. Hunt.

Quantity Class.—1st, Mr. W. J. Bamber; 2nd, Not awarded.

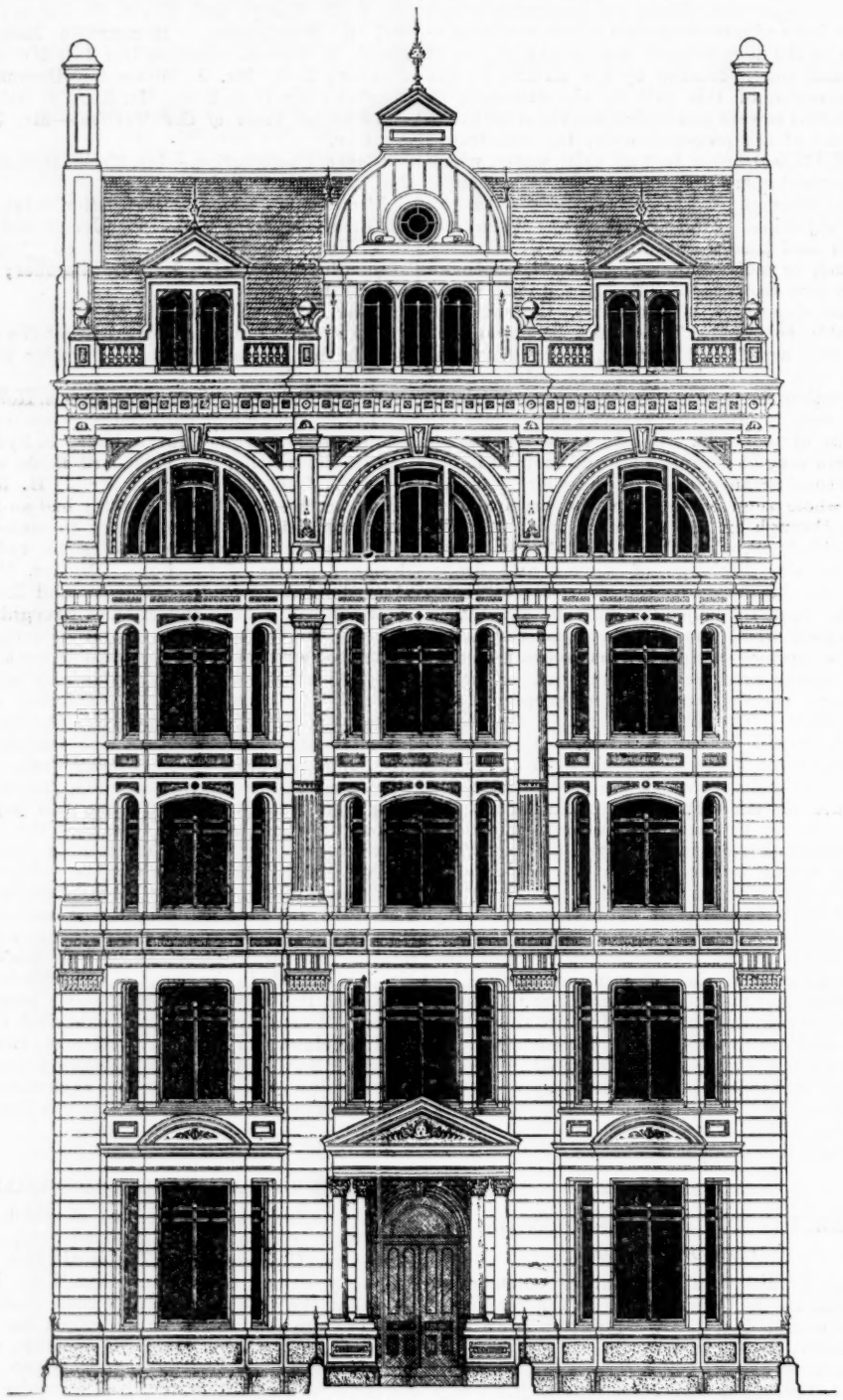
Essay Prize.—No competition.

The Prize Committee reported that the work done in the Elementary Class of Design was of unusual merit.

Amongst the exhibitors were Messrs. Holland, who exhibited an unusually massive mahogany mantel-piece designed for a house in Sydney, and an interesting oak sideboard made up of old work from the design of Mr. J. H. Rushbrook, architect. Messrs. Hindley had an ingle nook complete, with fire-screens to match, in white painted woodwork, and some quietly-designed pieces of furniture. Messrs. Morris showed some of their tapestries, and Messrs. Newman had a good collection of wrought-iron work. The Coalbrookdale Company exhibited some good specimens of their cast-iron work from designs by the late Alfred Stevens and Talbert. Messrs. G. Trollope & Son exhibited some large specimens of Mexican onyx in the form of pedestals and balustrades, and also some stained wooden panels in imitation of inlay work. Mr. Longden exhibited some good dog-grates and tiles, and Messrs. Jeffries some wall papers. Messrs. Walker exhibited in one of the committee-rooms the grate designed by Mr. T. Pridgin Teale, M.A., which was the subject of a paper read by Mr. Teale at the Association. The stove was fixed and alight, and seemed to give very good results. An exhibition of electric lighting for domestic purposes was made by Mr. M. J. Scott, in the form of portable lamps and fixed lights, worked from small accumulators. Messrs. Jenks & Wood exhibited some good specimens of furniture. Messrs. George Wright & Sons had on view a statuary marble chimneypiece, of good design and workmanship, fitted with one of their patent "As you like it" grates.

NEW HOSPITAL, KINGSLAND-ROAD.

This hospital, the first portion of which has just been erected in Kingsland-road, was opened on October 1st. The institution was originally named the Metropolitan Free Hospital, but the title has recently been changed, and the institution is now known as the Metropolitan Provident Hospital, patients, with the exception of accident cases, which will continue to be treated free, being required to make a small weekly contribution whilst inmates. The hospital has at present a frontage to Kingsland-road of 180 ft. in length, the administrative block being carried to a height of upwards of 80 ft., whilst the ward block is limited to 60 ft. height. From Kingsland-road the return frontage extends about 130 ft. in depth, the building covering a ground area of about 23,500 ft. The administrative block is at present at the south end of the general elevation, but on the completion of the entire scheme this portion will form the central feature, whilst the block containing the patients' wards, extending to the northern boundary, and comprising about three-fourths of the entire frontage, will have, on completion, a similar block extending to the southern boundary. The administrative block is faced with red brick and Portland stone. The adjoining block northwards, containing the patients' wards, has five floors, the elevation baing faced with stock brick, relieved by red brick bands and string courses. The south end portion of this part of the frontage is formed by a series of bay windows, giving an octagonal plan, and is surmounted by a turret. At the rear of the administrative block is an open area, and immediately beyond it westward is another large block running parallel with the Kingsland-road blocks. The whole of the wards are connected with the administrative block by a series of covered corridors at each floor level. The administrative block contains the medical officers' apartments, clerks' and secretary's offices, board-room, convalescent room, nurses' day-



Offices and Chambers, 3 and 4, Lincoln's Inn Fields.—Mr. J. Sawyer, Architect.

room, and also the matron's, doctors', nurses', and servants' apartments, and their bedrooms, and having on the topmost floor, in direct communication with a patients' lift, a large operating theatre, fitted with all requirements, and communicating direct with a choloroform and instrument room. The main wards are about 93 ft. in length and 24 ft. in width, each ward having accommodation for twenty-four beds. The wards are ventilated by flues and air boxes under each bed-head. The ventilating system has been carried out from the design of Mr. Collins, one of the architects of the building, the terra-cotta inlets having been supplied by Messrs. Doulton & Co. The culinary department is in the basement, and there are patients' and food lifts from the basement to each floor supplied by Mr. Goddard. The wards and other portions of the building are heated by Galton's stoves. Hot-water is supplied throughout the entire building by means of boilers and steam heaters, the arrangements having been carried out by Mr. Frazer. Protection in case of an outbreak from fire is afforded by hydrants placed on every floor, both internally and externally, in such positions as to command the entire frontages of the building, the system having been carried out by Messrs. Shand & Mason. Lightning conductors have been placed on every point likely to be in danger from lightning by Messrs. Cutting & Co. The gas-fitter's work throughout has been executed by Mr. Cannon. The cost of the building, exclusive of the land, so far as completed, will be about 25,000*l.*, which will be increased to 40,000*l.* when the additional wing is built. Messrs. H. H. Collins and James Edmeston are the joint architects, and Mr. Shurmur is the general contractor. Mr. Huxley has acted as clerk of the works.

Nos. 3 & 4, LINCOLN'S INN FIELDS.

The accompanying cut shows the elevation of the original design of the above-named new building in Lincoln's Inn-fields, which in execution has been somewhat modified in the upper part, above the fourth story. The building, which stands on the northern side of Lincoln's Inn-fields, is used for offices and residential chambers. The front is faced with Portland stone. The work was carried out by Messrs. Chapman Bros., of Kennington, for Mr. T. Clarke. Mr. Joseph Sawyer, of London and Spalding, is the architect.

Monument to Rossini. — It has been decided by the inhabitants of Florence to erect a monument in honour of Rossini on his grave in the Cathedral of Santa Croce. It will be erected by the sculptor Passaglia, and will consist of a portrait statue in marble of the composer, on the base of which figures in bas relief symbolising some of his most celebrated works will be executed.

THE WALLS OF CHESTER.

Sir,—I will trouble you to correct a printer's error in the printing of my last letter. I did not write *Artois*, but *Arlon*. Arlon is the capital of the Duchy of Luxemberg, and is situated about fourteen miles from the town of Luxemberg. It is the modern representative of the Orolaunum of the Itinerary of Antoninus. It is there called a *Vicus*, and therefore it may be supposed to have been walled at a comparatively late time, probably at about the close of the third century. The walls were built, in the lower parts, with dislocated sculptures of monuments, chiefly sepulchral, laid without mortar, although the portions above were cemented. In this there is a great similarity to the walls of Chester, and to others to which I propose to refer ere long.

Mr. Shrubsole having obligingly sent me a photograph of the sculptured stone he and Mr. Watkin imagine to be Mediæval, I may remark that it in no way changes my view of Mr. Brock's sketch, only that I discern in the hands of the second personage, also a girl, the foreshortened figure of an animal, probably a pet cat, such as we find on one of the stones from the walls of Bordeaux previously referred to. On this I have just received from Mr. Robert Blair, F.S.A., the following opinions:—"I have seen the photograph of the Chester so-called Mediæval stone from the walls, at Dr. Bruce's. Both he and I agree that it is, beyond all doubt, Roman."

C. Roach Smith.

Temple Place, by Strood, October 10th, 1887.

Sir,—In reply to Mr. Shrubsole's letter [p. 512], permit me to say that the mortared part of the wall, with small stones, and the unmortared lower part of massive ones, are fairly of the dimensions I have given, and that they were taken with the City Surveyor.

Is your correspondent referring to the same place? His mention of a cornice leads me to think that he is not doing so, for there is none at the point I named. Where the cornice does occur (it begins about 50 ft. east of the North Gate), the large Roman stones go quite from base to cornice, this being their greatest height; but this is not the point I named. At other places along the wall they are lower than the height I gave, in some cases being only one or more courses high; in others they are not visible. The height I gave refers only to the point named. At other places the wall is much higher, in others rather less.

Mr. Shrubsole saw a man thrust in his arm "between the layers of stone, first removing the dry earth," and asks if this can be Roman work? I did something of the sort myself, but it was in places where the removal of inscribed stones made it possible to do so. I can but think that your correspondent has taken some of these gaps for what he reports, although I have already called attention to the fact that there is earth in the open joints. It is a peculiarity that these joints do not appear ever to have been filled in either with pebbles or broken stones. I think that few antiquaries will object to the removal of Roman stones from a later Roman wall, but many gaps have been made here which have to be filled in with modern masonry.

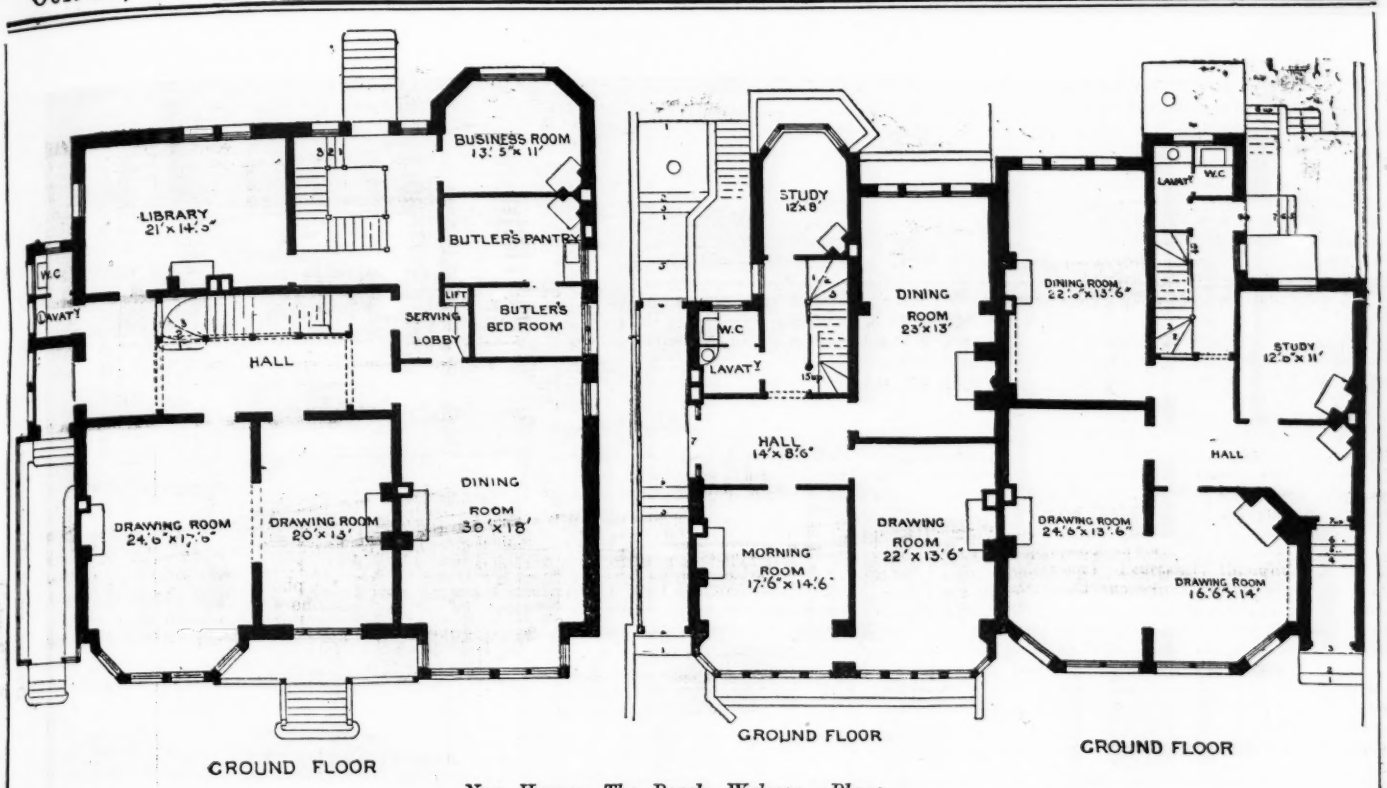
I saw none of the unmortared part formed of "loose" stones,—all is a compact mass. It might not be incorrect to say so of some of the poorly-built mortared wall above it, particularly the inner face.

I will take this opportunity of correcting a mistake in my letter (p. 511). What I then said of North Gate applies to East Gate. There are so many diverse views of the latter that I took one to apply to the former, following the inscription on the gate itself relative to its Roman foundations, on being rebuilt in 1808. Mr. Thompson Watkin, whose "Roman Cheshire," I had not to hand at the moment, acknowledges, p. 106, that these foundations are of Roman date. This brings out the fact that, instead of there being but one Roman gate in line with the present walls, there were in reality two in existence until fairly recent times. Surely this must make it more difficult for Mr. Watkin to believe that the massive stones in the walls, which he acknowledges to be Roman, could ever have been shifted in position, as he asserts. There they are, in line with the gates in both cases, where Roman walls must have been.

Into his interesting conjectures relative to what Elfleda did at Chester, I need not enter, except to say that whatever was done must be regarded in relation to the Castle. There is there a grassy mound upon which the Normans *did not* erect their masonry keep. No one who has studied an interesting series of articles in some past volumes of the *Builder*, under initials whereby we can readily recognise the name of an esteemed antiquary, can doubt the Saxon origin of such works. I am not an advocate for theorising without certain facts, but in this case it may be a safe supposition to consider this mound as the work of Elfleda, and as the key of her fortifications, which, from analogy with other works, we should expect to have been ditches and earthen banks with stockading, and not masonry.

E. P. Loftus Brock.

No. 36, Great Russell-street, W.C.
October 11th, 1887.



New Houses, The Beach, Walmer.—Plans.

SIR,—I asked Mr. C. Roach Smith in my last if he ever knew of the walls of a Roman *castrum* (not of buildings or aqueducts) having been built without mortar, and I added that I would not include the walls of the towns on the Continent which he named, as the date of their erection had been disputed. Mr. Smith does not answer the question, but evades it; and, while admitting that I am right in saying the date of the erection of these Continental walls has been disputed, says that it is "in vain he has referred me to them, *i.e.*, to prove that the Chester wall is Roman. Certainly *it is* in vain that he has referred me to them, when the only instances he can refer to of so-called Roman walls of *castra* built without mortar are these disputed ones, and, like the portion just laid bare at Chester, they are composed of sculptured and inscribed stones. Therefore, at the outset, there is the same suspicion as to the origin of the Chester fragment, which seems more than ever confirmed by the opinions of many archæologists concerning the walls similarly composed (though with the addition of mortar) in London.

Mr. Smith's comparison with Richborough, &c., does not hold good; for the newly-excavated portion at Chester is not, like Richborough, &c., built upon layers of boulders. In the only foundation of boulders laid bare at Chester (that of the destroyed southern wall), the boulders are set in strong Roman concrete.

With regard to Mr. Smith's statement that the arguments as to the Continental walls he named, not being Roman, are "as illogical and futile as those adduced in favour of a Jacobean theory to explain the walls of Chester," I may say that I have neither started, advocated, nor discussed any "Jacobean" theory. My views are explained at length in my reply to Mr. Brock in your issue of September 24th.

Mr. Brock candidly admits that he does not know of any *castrum* in Britain, the walls of which were built without mortar, but refers to these doubtful Continental examples, and says they are a strong argument in favour of the Chester fragment being Roman. I should opine it was just these discredited Continental examples that would help to increase the evidence against the Roman origin of the Chester fragment. He seems to be misinformed also as to the extent of the mortared portion of the latter. The only mortar is at the extreme upper part, and that is modern.

Next, Mr. Brock avers that Roman mortar has been "detected" on the Roodeye stones. Certainly it has. It was "detected" during the recent excavations made in front of them three or four years since, fragments of it adhering to some of them; and this fact, with the nature of the tooling on some of the stones laid bare, helped me to see that the latter were Roman, brought from a large building. Mr. Brock will, however, *find no layers of Roman mortar between the stones.*

Mr. Brock states also that the evidence shows that the stones in the newly-excavated part of the north wall were not lifted into their places by means of the lewis-holes still existing in some of them, but they were rolled into position, that "labour was cheap, and that progress was slow." He asks whether any seventeenth-century builder would have done this, and if it is not fatal to any late date. Whether "any seventeenth-century builder" would have done this is beside the question. The Parliamentarian army (whom I have put down as the builders of this fragment) could do it, and labour would consequently be "cheap." With a strong force, I see no necessity for progress being "slow."

Mr. Brock's remarks as to the number of stones from "the ruined suburbs" lying about after the siege that would be available for rebuilding the wall instead of searching for Roman stones, to my mind contradict what he has just before stated. If the stones were "rolled into position," would they be carted or rolled all the way from the suburbs? Numerous ruined Roman buildings were close at hand (and also the building of doubtful date lying parallel with the north wall, opposite the Deanery, laid bare in 1884), and there need be no "searching," unless taking up visible foundations, &c., be deemed "searching," whilst the tombstones turned up in Lady Barrow's Hey and elsewhere, when the numerous entrenchments were made, would be ready to hand. Many (or most) of the stones of the former wall (probably of Edwardian date) would be lying about also, close to their former positions, and Mr. Brock should bear this in mind, in his formidable calculation of the amount of stone required, and also in his calculation of cost.

Coming to the "buttressing wall," Mr. Brock remarks that I am speaking of the south face of the north wall. He is mistaken. The "buttressing wall" is on the northern face, whilst as to the North Gate existing as a double Roman archway until the middle of the last century, he is still more strangely mistaken. No Roman archway existed at any of the Chester gates until the last century, but it is the East Gate that Pennant describes and engraves, as mentioned by Mr. Brock, who cannot have read the singular and varied accounts of it which I have collected and given in "Roman Cheshire."

Ormerod ("Hist. of Cheshire," vol. i., p. 281) says:—"The (North) gate at the period of its demolition, consisted of a dark, narrow, and inconvenient passage under a pointed arch, over which was a mean and ruinous gaol, equally inconvenient, and varying little in appearance from the delineation of it given by Randle Holme in Harl. MSS., 2073."

This gate was pulled down in 1808, but, as I have said ("Rom. Chesh.," p. 106), it was probably built upon Roman foundations, which may still be left undisturbed beneath the present structure. If a Roman arch *had* existed here in the last century, we might, as Mr. Brock suggests, go into the question of Roman work near it. But no one has ever advanced the least claim to the old North Gate (which was remembered by many who have died within the last fifteen years) having been Roman.

Whether any further excavation is to be made near these walls (though Roman inscribed stones are in sight, and only wait to be dislodged) I cannot say. Canon Raine, in last Saturday's *Academy*, advocates every Roman inscribed stone which has been detected, being taken out, on the ground of the wall being of comparatively modern construction.

W. THOMPSON WATKIN.

Liverpool, October 10th, 1887.

Illustrations.

DESIGNS FOR MILAN CATHEDRAL FAÇADE.

WE give this week a lithograph of MM. Hartel & Neckelmann's design, accepted in the first competition for the new façade of Milan Cathedral, from a photograph of their drawing forwarded to us by the architects; and another of a design by Messrs. Pugin & Pugin, exhibited with the others, but excluded from the competition on account of delay in delivery, the fault, we understand, of one of the railway companies. Further remarks on the subject will be found on another page.

The *Illustrazione Italiana* published small woodcuts, in a recent number, of all the designs, from which we have reproduced four, which may be useful as giving a general idea of some of the designs, though, of course, they cannot represent the detail in any adequate manner.

NEW HOUSES, THE BEACH, WALMER, KENT.

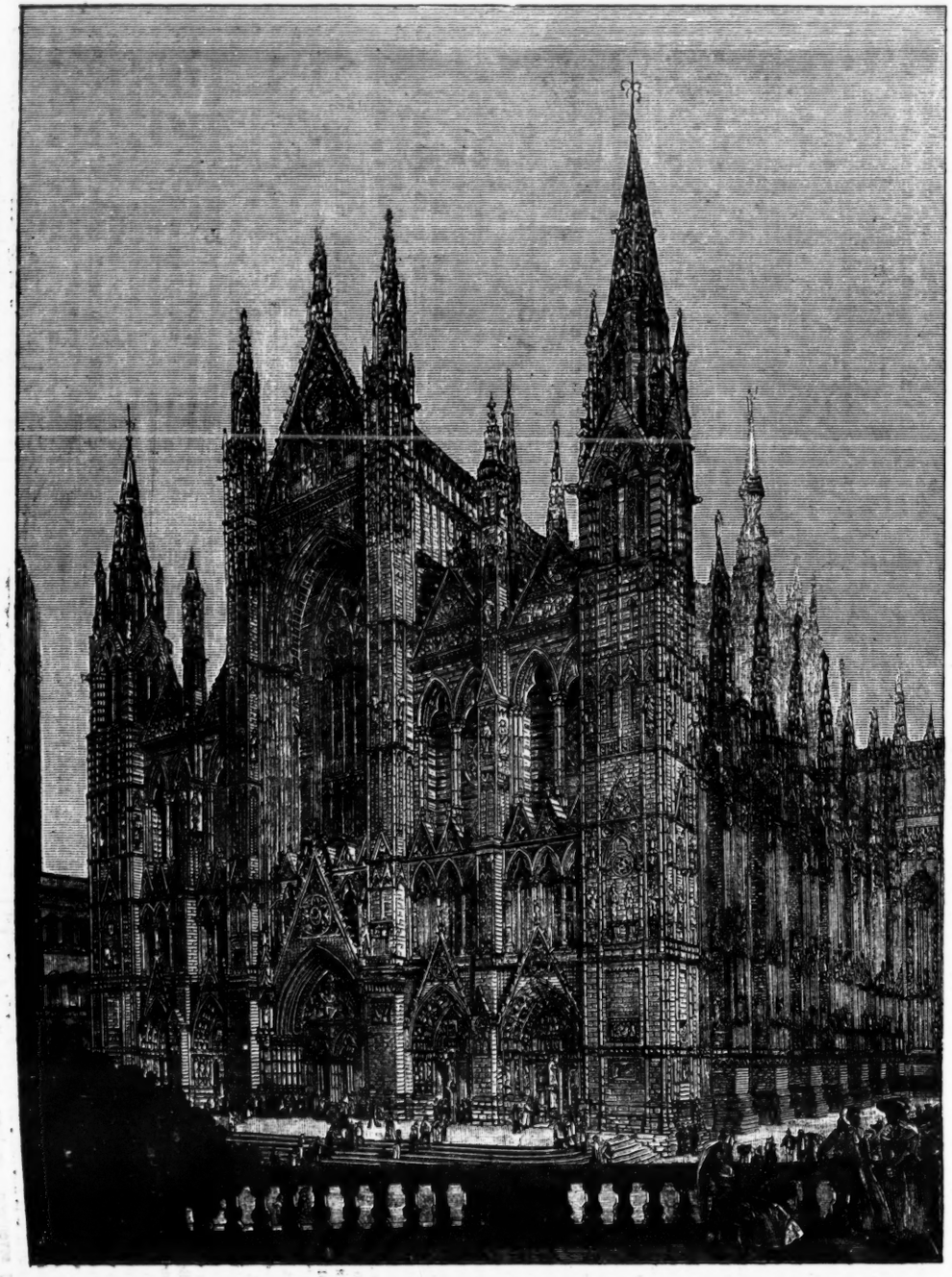
THE drawing from which our illustration is taken was exhibited in this year's Academy exhibition. The buildings have been erected by day work by Mr. A. Tod, from the designs and under the personal superintendence of Mr. James Neale, F.S.A. The three larger houses on the right are finished and occupied, but the other house shown on the drawing is not yet erected.

A COUNTRY HOUSE.

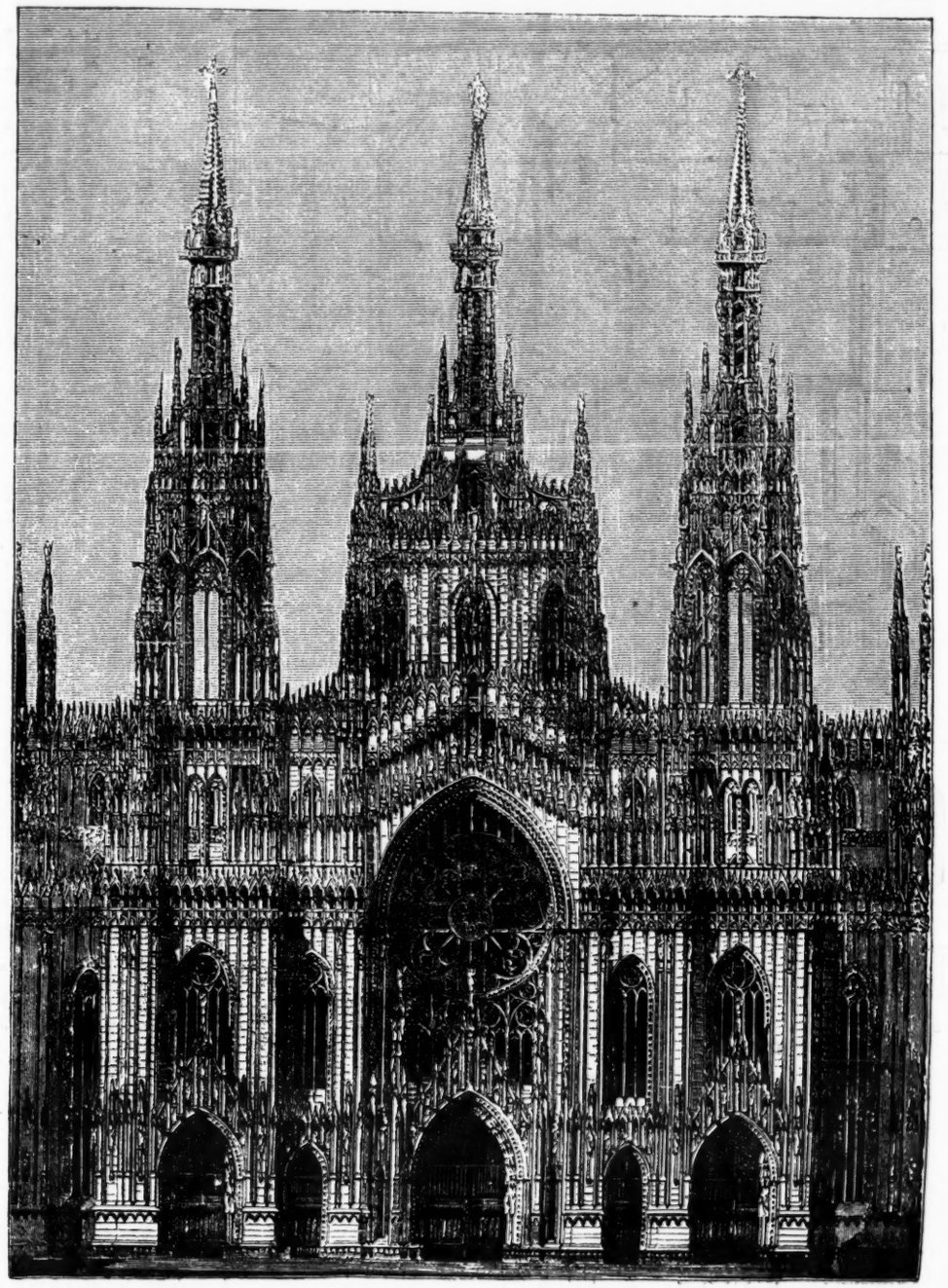
THIS house, of which we give a plan and perspective sketch, is to be built of red bricks, with stone mullioned windows and dressings; the half-timber work is in oak; tiles of an orange-red colour are to be used for the roofs and weather tiling. The estimated cost is 2,750*l*. Mr. Langton Dennis is the architect.

ENTRANCE LODGE, WALMER, KENT.

THE illustration is taken from a drawing exhibited at the Royal Academy. The Lodge has been erected by Mr. Tod, from the designs and under the personal supervision of the architect, Mr. James Neale, F.S.A. There were no contracts excepting for the following works: Messrs. Frost Bros., of Deal, for the gas and plumbing; and Messrs. Potter & Son, of London, for the ornamental ironwork. The lower walls of the Lodge are hollow, being faced with Kentish rag, worked in courses and backed with brickwork, with quoins of red Teynham bricks. The upper story is of timber and pebble-dashing; the roofs are covered with Collier's Reading tiles. The sweep of the gates was arranged so as to preserve the two large trees, as shown on the drawing.



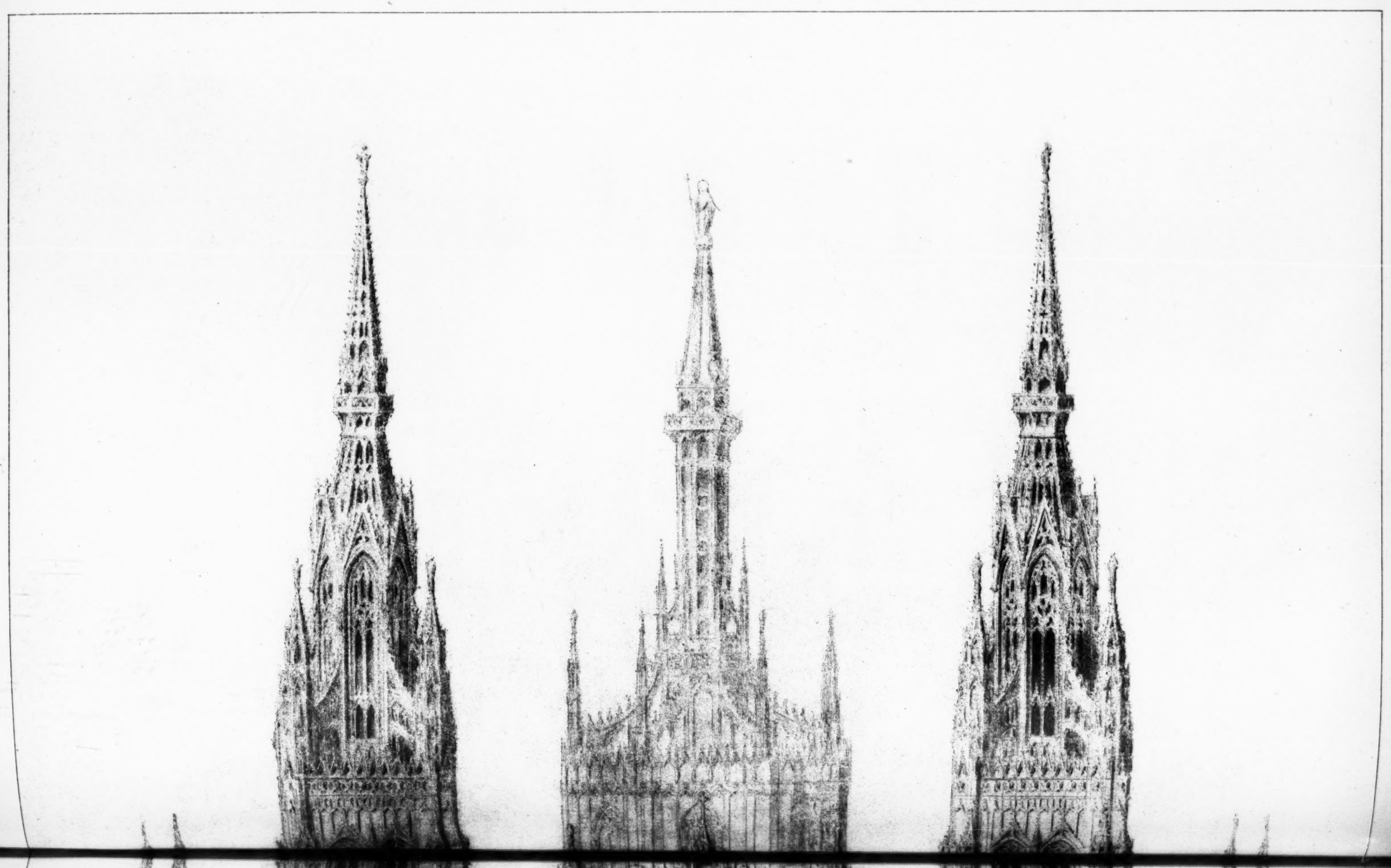
Design by Mr. D. Brade.

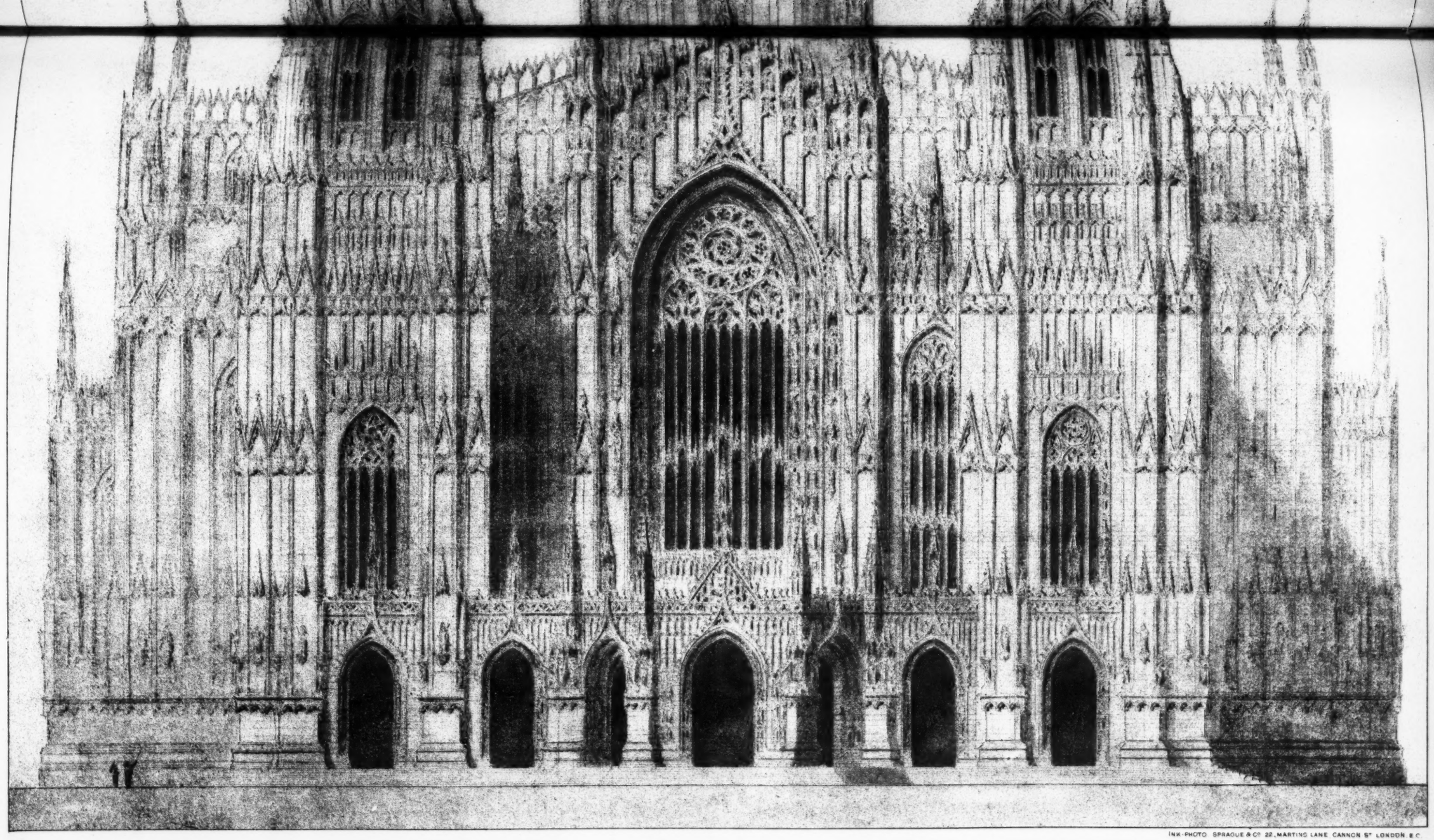


Design by M. Deperthes

DESIGNS FOR MILAN CATHEDRAL FAÇADE. (*From Woodcuts published in "L'Illustrazione Italiana."*)

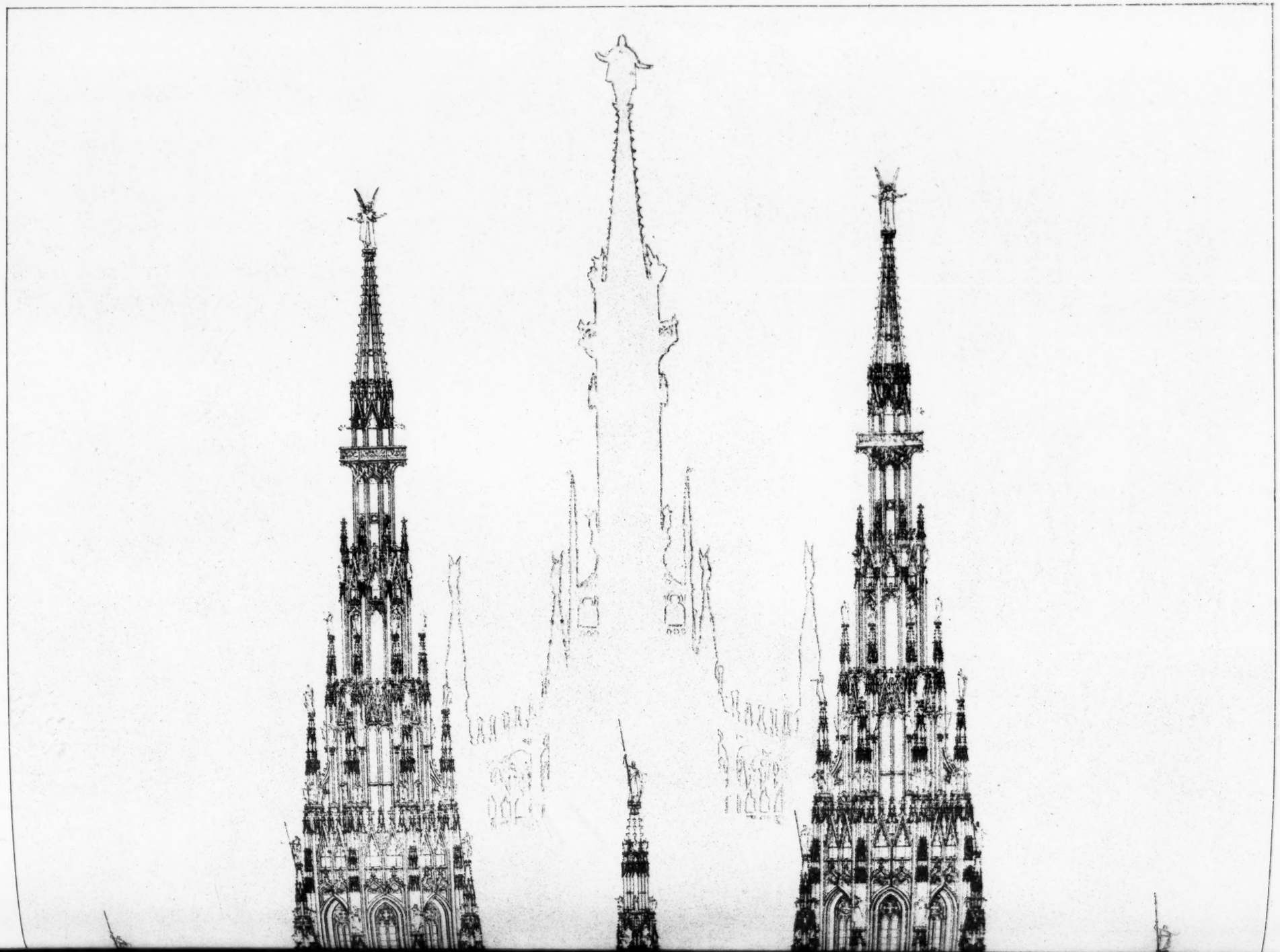
DESIGNS FOR MILAN CATHEDRAL FAÇADE. (*From Woodcuts published in "L'Illustrazione Italiana."*)

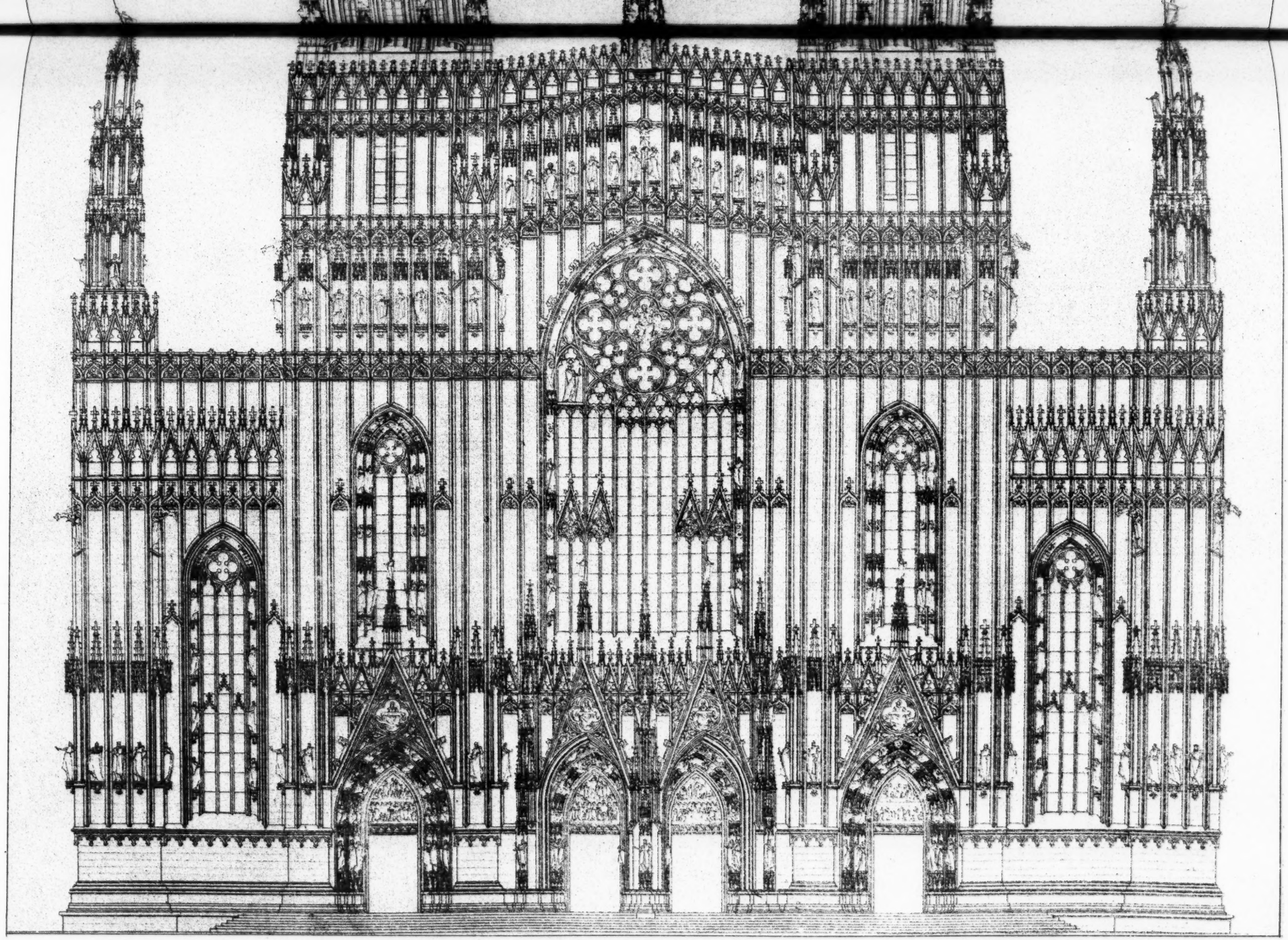




INK-PHOTO. SPRAGUE & Co 22, MARTINS LANE, CANNON ST. LONDON, E.C.

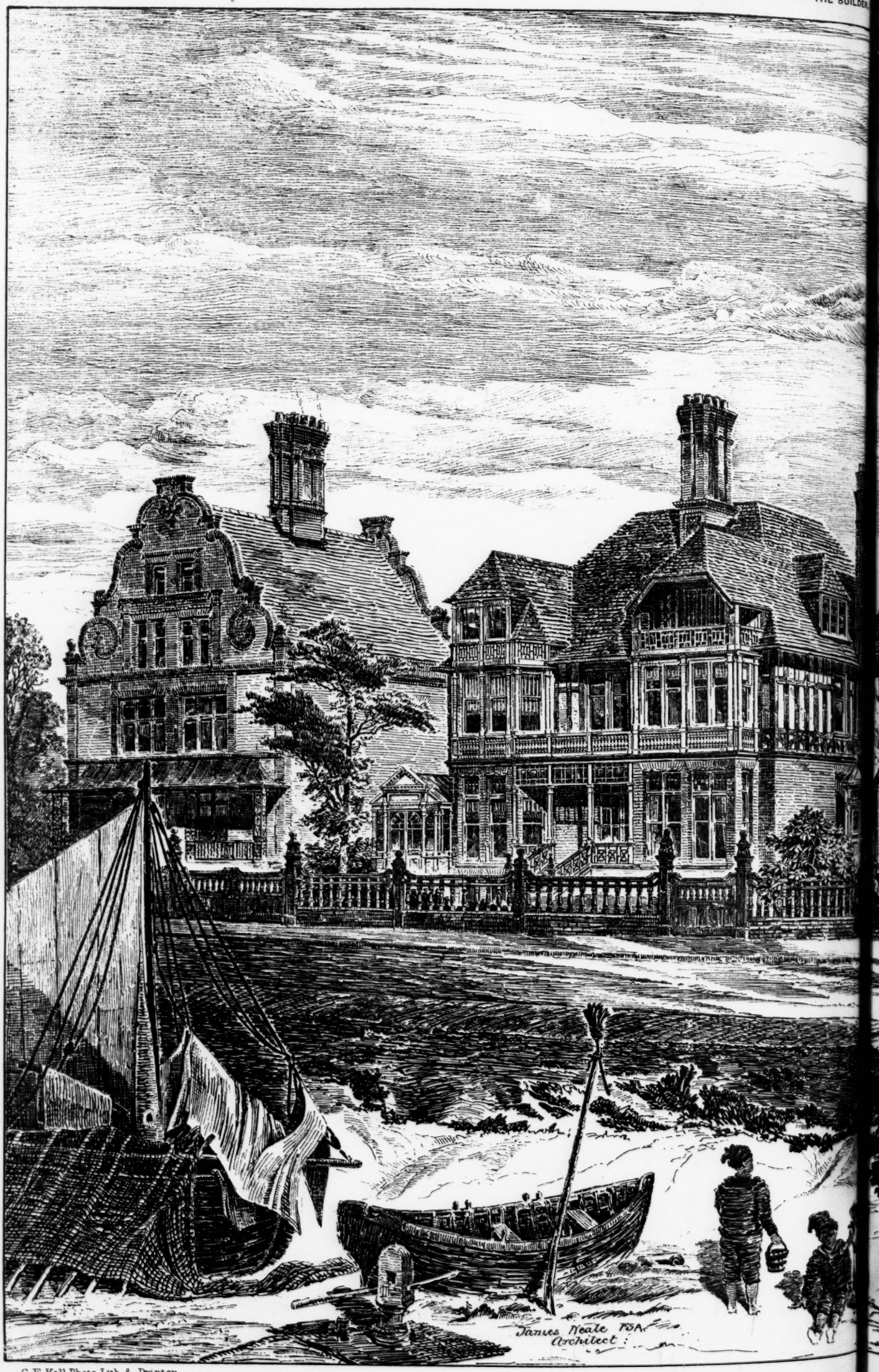
DESIGN FOR FAÇADE, MILAN CATHEDRAL.—By Messrs. Pugin and Pugin.





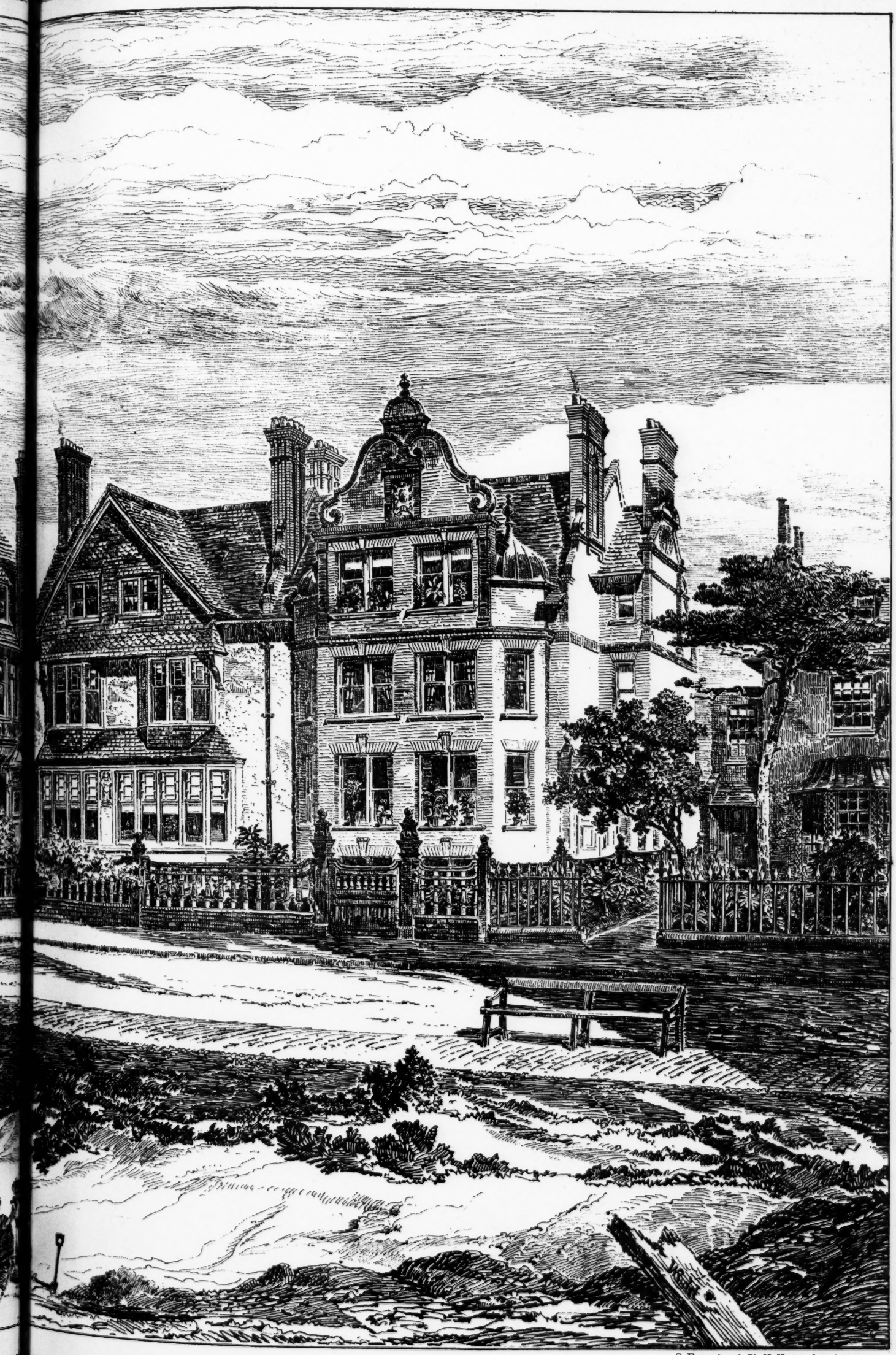
INK-PHOTO. SPRAGUE & Co 22, MARTINS LANE, CANNON ST. LONDON, E.C.

MILAN CATHEDRAL FAÇADE COMPETITION.—Design by Messrs. Hartel and Neckelmann.



C. F. Kell Photo-Lith. & Printer.

NEW HOUSES, THE BEACH, WALM KE

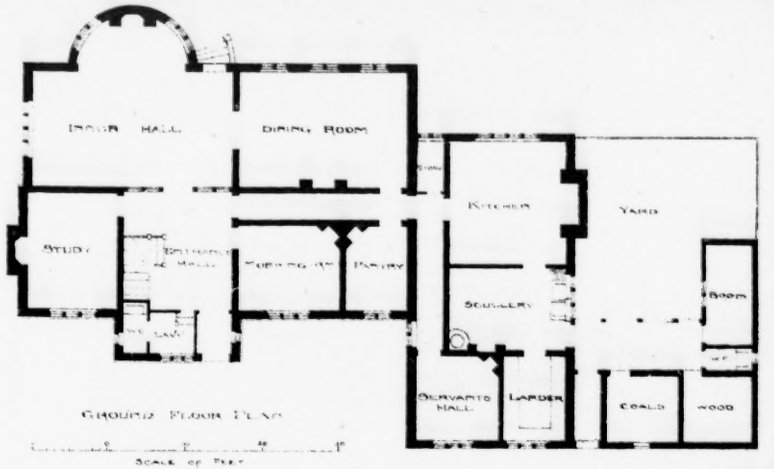


8, Furnival St Holborn. London. E.C.

KENT.—Mr. James Neale, F.S.A., Architect.

A COUNTRY HOUSE.

LANGTON DENNIS, Architect.



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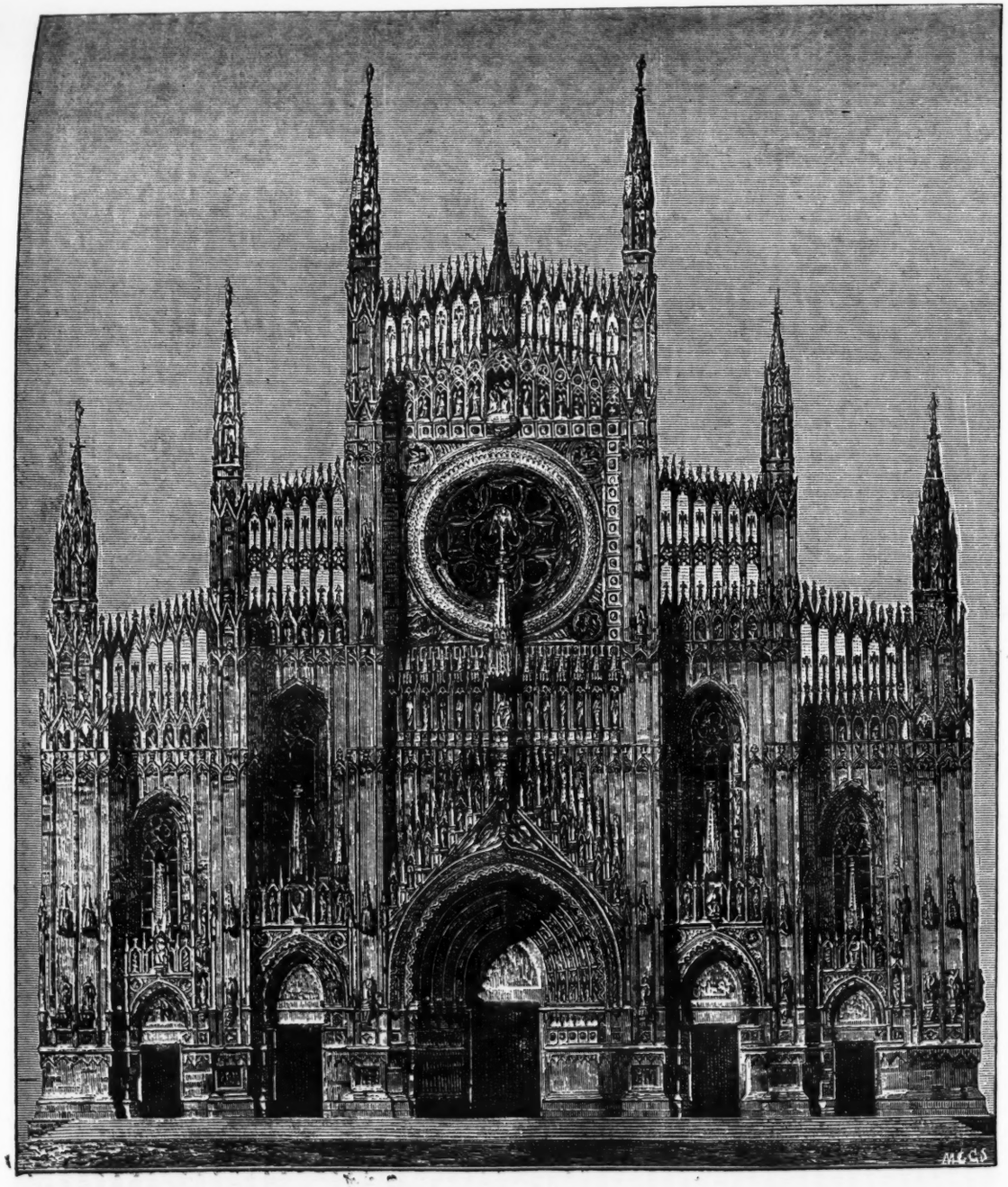
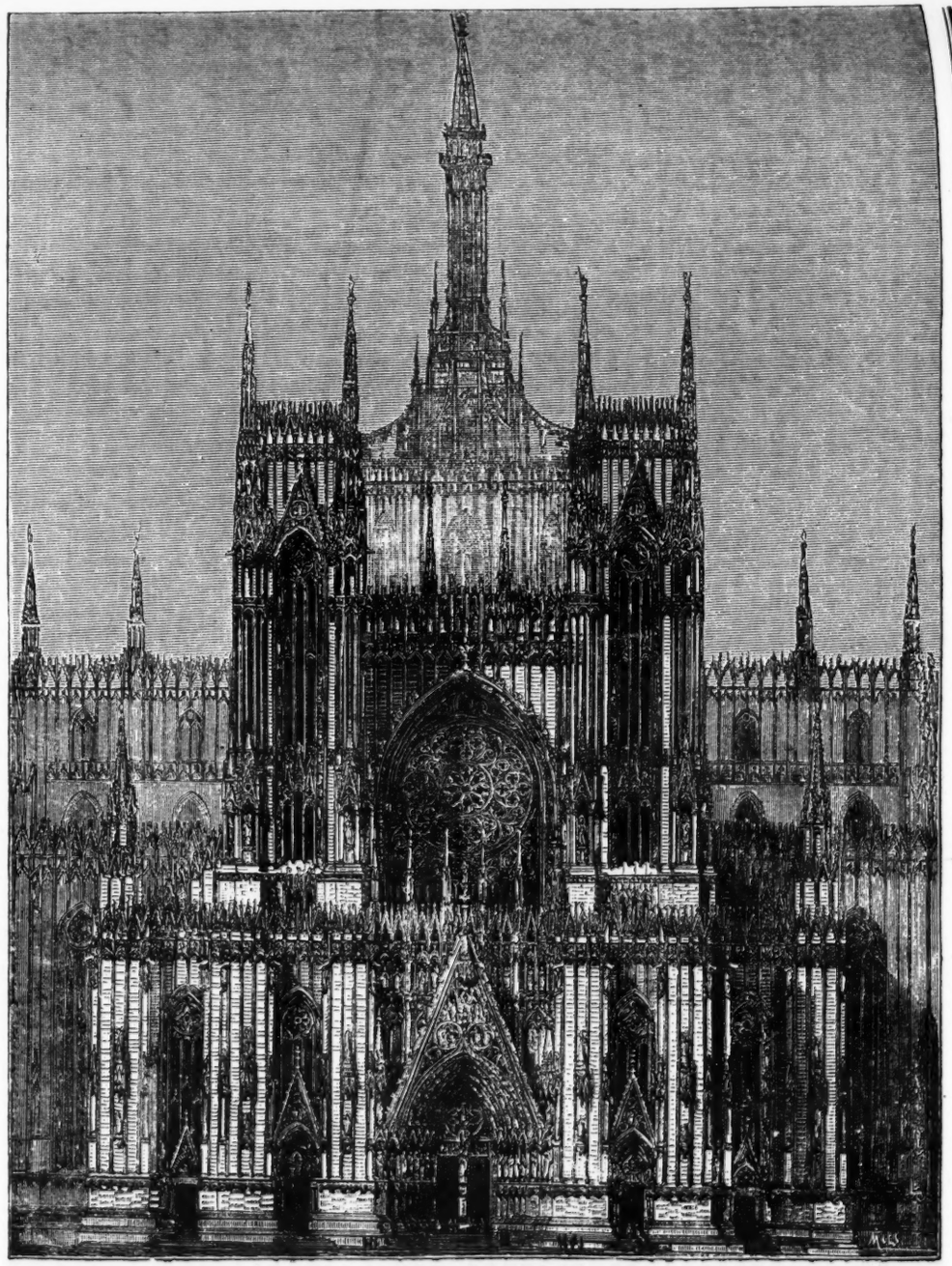
ENTRANCE LODGE AT WALMER, KENT.—Mr. Jas. Neale, F.S.A., Architect.



Design by Signor Locati.



Design by the late M. Tschagin.

DESIGNS FOR MILAN CATHEDRAL FAÇADE. (*From woodcuts published in "L'Illustrazione Italiana."*)

"SHONE'S EJECTORS IN THE RECENT RAINSTORMS."

Sir,—The defenders of the Shone system of raising liquids would have a very good brief, so far as low lifts are concerned, if the assumptions on which the theoretical calculations of efficiency are based could be relied upon, viz., that the losses due to leakage and fall of temperature are practically inappreciable. The excessive value of the ratio of power to work, which Mr. Shone after about ten years' experience has found it necessary to adopt, proves conclusively that he has found from actual practical results that the losses due to these causes are very heavy. Demolition of the arguments of the "clique" will further the objects he has in view much more effectually than insinuations of improper motives. Statements and arguments either fenced with or passed over in silence are *ipso facto* admitted to be correct.

In claiming to have discharged his duty as engineer by providing engine power capable of pumping a larger volume of sewage than the committee authorised him to provide for, Mr. Shone virtually disclaims having acted as chief engineer responsible for designing and carrying out an installation capable of dealing with the whole discharge from the Palace sewers. Who, then, was the responsible engineer? I certainly thought that Mr. Shone had designed the whole of the works as they are now carried out. Were the plans countersigned by some higher authority? Mr. Shone says that he has provided pumping power capable of dealing with more than three times the volume the committee authorised him to provide for. By whose authority did he make this additional outlay? Clearly, if he was not the responsible engineer, he had no right, *proprio motu*, to deviate from the instructions of the committee.

I agree *toto cælo* with Sir Robert Rawlinson in fixing upon 400 gallons a minute as the maximum volume necessary to be provided for by pumping. Provision for dealing with a larger volume by this means involves a useless waste of public money. The excess storm-water ought to be discharged through a storm-water outlet. There is in the existing installation a 12-in. pipe connecting the sump with the metropolitan sewers, provided with a reflux valve, so that whenever the surface of the sewage in the sump is higher than that of the sewage in the metropolitan sewers, the sewage will flow by gravitation from the sump to the sewer. Mr. Ault, the partner of Mr. Shone in the paper which he read at the meeting of the Society of Engineers, suggested that this outlet might be used in dry weather to let the Palace sewage flow into the city sewers by gravitation. If that plan were adopted, whenever the pipe was not full, there would be established a free communication, by which the sewer gas of the city sewers in its hot weather concentrated state, would flow back into the subway, and the main object of the huge installation would be frustrated. Mr. Shone, however, in his pamphlet, presented to the members, states that it will act automatically as a storm-water overflow, when the pumping power is overcome. Mr. Shone, therefore, or whoever may be the engineer responsible for the success of the work, has not made the mistake of supposing a storm-water outlet to be unnecessary, but the mistake of designing one of insufficient capacity.

I am quite sure that none of the "clique" have the least desire to deny Mr. Shone and Mr. Phillips the gratification due to success. Those gentlemen must, however, prove the validity of their claim. I emphatically assert that time will prove the installation to be a failure, not only as a means of discharging the sewage, but in a sanitary point of view. I am sure you will grant me space to repeat the reasons which cause me to hold these views, and to state them in such a way that silence on Mr. Shone's part must convince your readers of their truth.

Mr. Phillips has not answered either of the crucial questions I asked, viz., How did he ascertain the height of the sewage in the metropolitan sewers, and (I admit indirectly) the depth of the sewage in the subway close to the pump? The bottom is flat, 3 ft. wide, and laid at a gradient of 1 in 225, so that a depth of 12 in. above the concrete close to the sump would correspond with a storage of 2,000 gallons. The 6 in. above the pipe in my last letter is a clerical error; it should be 16 in. I also ask Mr. Shone to state what is the maximum air pressure used since the commencement.

Mr. Phillips has stated that with an air pressure of 10 lb. per square inch the four gas engines were able to discharge in an hour the whole of the rainfall on ten acres at the rate of ·59 in. per hour, with the exception of 2,000 gallons against a head of 20 ft. I think Mr. Phillips has overstated the acreage, but he has committed himself to the statement that the whole of the sewage discharged by the Palace sewers was dealt with in the way described. Mr. Phillips seems to think that for an interval of two minutes the rate of fall may have been double, ·59 in. per hour, but I presume neither he nor Mr. Shone questions the accuracy of the Westminster gauge as to the total rainfall in the hour. In the printed report, I did not see Mr. Shone's verbal statement that the pipes are 6 in., and concluded he had found he was mistaken. I find they are 6 in. For argument, I will also take the minimum area, viz., eight acres. This will correspond with 1,782 gallons per minute, of which, according to Mr. Phillips, 34 gallons per minute were stored, lesving 1,748 gallons per minute to be otherwise disposed of. If the whole was pumped each ejector must have discharged 583 gallons in thirty seconds, or at the rate of 19·4 gallons per second. The corresponding velocity in the 6-in. pipe would be 16 ft., and the theoretical head due to this velocity 4 ft., which corresponds with an air pressure of 1·8. The pressure due to the dead lift of 20 ft. is 8·8 lb., so that without any allowance for friction or valve resistance, the air pressure cannot have been less than 10·6 lb. Adding, as before, 3 lb. to overcome these resistances, we get the minimum necessary pressure of 13·6 lb. to the square inch. The area of the valve passages is rarely equal to two-thirds of the pipes. In the case of the Palace ejectors I feel sure it is not equal to this, but if equal to it, the velocity in the valve passages would be 2¼ times that in the pipes, or 37 ft. per second. This corresponds to a theoretical head of 20 ft., the corresponding air pressure being 8·8 lb., or the minimum total pressure 17·6 lb., without any allowance for heads due to friction and contraction. A discharge of 300 gallons per minute from each ejector would only require half the pipe velocity, and the 8·8 lb. would be reduced to 2·2, or the minimum pressure necessary to discharge 900 gallons a minute against a 20 ft. head, 11 lb. It is possible, therefore, that a pressure of 12 lb. to the square inch would be sufficient to discharge 1,000 gallons a minute. As a matter of fact, I know from actual observation that the ejectors cannot discharge 300 gallons a minute against a 20 ft. head with 10 lb. air pressure. Mr. Shone has utterly misrepresented what I said at the meeting of the Society of Engineers about the discharging capacity of the ejectors. I never stated that the ejectors could discharge 1,000 gallons a minute against a 20 ft. head with an air pressure of 10 lb., and I emphatically deny stating that the estimate I did give was based on theoretical calculations. As a matter of fact, I gave the details of the three observations of the time of discharge of the 500-gallon ejector, the times in each case being as nearly as possible equal and a little under forty-five seconds. If then the ejector discharged 500 gallons, the rate of discharge was about 330 gallons a minute. As the diameter of the pipes of the 300-gallon ejector is the same as that of the 500-gallon ejector, the discharging capacity of each ejector is the same, and I now ask Mr. Shone the question, which Mr. Phillips has declined to answer for him, Why did he specify the 500-gallon ejector? On the day I examined the installation there had been a little rain in the morning,—sufficient to necessitate the use of two gas-engines,—but it had ceased about two hours before my visit, and one engine was doing the work with ease. It is therefore quite certain that the sewage in the metropolitan sewers cannot have differed much in depth from its normal eleven o'clock level, so that the maximum lift cannot have exceeded 14 ft. The engines are calculated to exert only 4-h.p. at the brake, where the air-pressure is 10 lb., and as they can exert 5-h.p. brake-power, they would be able to supply air compressed to 12 lb. per square inch, and at this pressure I estimated that the three ejectors might be able to discharge 1,000 gallons against a 20 ft. head. Mr. Shone, however, is not entitled to claim the reserve power provided to meet accidents to machinery, in estimating the discharging capacity of his installation. As there are three ejectors, he is entitled to claim two-thirds. The discharging capacity, therefore, with 10 lb. air-pressure would not exceed 500 (five hundred), and with 12 lb. air-pressure 700 (seven hundred), gallons per minute against a 20 ft. head.

Taking 1,000 gallons as the maximum volume, which the ejectors can discharge in a minute against a 20 ft. head, with 12 lb. air-pressure, the work estimated in weight of water raised will be 6-h.p., and the necessity engine *brake* power 20-h.p., which is certainly equal to fully 27-h.p. indicated, or the ratio of indicated horse-power to the horse-power in work done 4½ to 1. I know that Mr. Shone bases his calculation on a discharge of once a minute; in other words, in fixing his engine-power, he estimated for a discharge of 900 gallons a minute, since the 500-gallon ejector cannot discharge more than the 300-gallon. This he thought could be raised 20 ft. high with 10 lb. air-pressure, corresponding to 16-h.p. brake horse-power of gas-engines equal to at least 21-h.p. indicated. As the work in weight of water raised is only 5½ h.p., the ratio of horse-power indicated to horse-power in actual work estimated to be necessary by Mr. Shone himself is nearly 4 : 1. *Experience has shown that it is not sufficient.*

I do not in the least doubt Mr. Phillips's veracity, but he is labouring under a misapprehension as to the actual facts of the case, which will be effectually removed when he prepares his answers to the two crucial questions I have had to ask him a second time.

That Mr. Shone should have provided, as he deliberately states that he has done, a reservoir for diluted sewage extending the whole length of the Houses of Parliament, is simply incomprehensible. Ever since he took up the sewage question his whole efforts have been directed to procure the condemnation of large sewers laid at flat gradients, whether or not intended to be used as reservoirs. He has always described them as elongated cesspools. They are, however, cesspools which can be periodically flushed. The reservoir he has provided at the Houses of Parliament is an elongated cesspool in a much worse state than those sewers, because its contents will be stagnant and the sewage sediment spread over a flat concrete bottom 3 ft. wide. No rainfall goes directly into this "subway" reservoir. All has to pass through the 12 in. sewer so that the contents of the reservoir must necessarily be very foul. The fact that the whole discharge passes through this 12 in. pipe makes the flooding of the Victoria Tower quadrangle inevitable long before the sewage in the sump rises to the maximum height attained by the sewage in the city sewers, because the head necessary to force the 3,000 gallons a minute corresponding to a rainfall of 1 in. cannot be less than 12 ft. In other words, the surface of the sewage at the Victoria Tower will be 12 ft. higher than the surface at Speaker's Green.

There are several large pockets in the crown of the subway which, until recently, were simply reservoirs of foul air. In the printed report of Mr. Ault's paper it is stated that these are now ventilated by gratings. No wonder there are foul smells in the courtyards.

The remedy for these defects is, however, simple. Separate collecting sewers should be provided for the rainfall discharging directly into the subway, the brickwork block between the city and Palace sewers replaced by a reflux valve the full size of the sewer, and the communication between the sump and the subway stopped.

Mr. Shone has not challenged the accuracy of the rest of the statements I made at the meeting; his silence, therefore, must be taken as an acknowledgment of their truth.

As I have been compelled to contradict two statements made by Mr. Shone, I feel that I ought no longer to use a "nom de plume." I therefore, subscribe my name and address,

William Donaldson.

2, *Westminster Chambers.*

"NEW METHOD OF VENTILATION."

Sir,—We have read the description in your current issue [p. 486] of what the patentees, in a circular issued by them, term a "new method of ventilation"; but far from being new, it is really a very old method, we having applied it to fireplaces as far back as fifteen years ago at our old offices at Mansion House Buildings. Instead of a cylinder the bottom of the shaft brought down from the ceiling level terminated at the floor-level in an air-tight casing, made of mica, enclosing the fire-place, so that the fire was made to draw its supply of air down through the ventilating tubes, and no draught was experienced by any one sitting in front of the fire, as is the case with the ordinary fire-grate.

We later on discovered that the idea of carrying a tube down from the ceiling, and connecting it with the throat of the chimney, was not original, a Mr. Hoey, of Glasgow, having used this arrangement about five years before, but without the air-tight casing.

About nine years ago we applied this principle to large sugar works at Greenock, there being six shafts employed altogether for the ventilation of the char-room, the shafts being led down from the ceiling, and communicating with the ashpits of the furnaces, which were otherwise made air-tight below the furnace-bars. Many years ago we took out a patent for the application of this principle for the ventilation of steam-ships, pipes being led from the different parts of the vessel down to the furnaces, which were made to draw their supply of air through these channels.

We are not surprised that the patentees are, as you say, in some doubt as to the function of "the cylinder." We have carefully studied this part of the arrangement, but fail to see what possible advantage can arise from its use. The inventors say that in the event of a reversal of the current in the chimney it will prevent back draught in the ventilating tube, but even allowing that it did so, which we doubt, a simple valve placed in the shaft would effect the same thing at considerably less cost and trouble. Our experience of this principle, as applied to buildings, is that there is no advantage whatever in bringing a shaft down from the ceiling and connecting it with the chimney, as an ordinary mica flap ventilator fixed in the chimney-breast at the ceiling level answers the purpose equally well, if not better, and the cost of the one as compared with the other is a mere trifle, amounting to only a few shillings, whilst, with regard to the trouble and labour involved in the fixing, there is no comparison. Both plans depend for their action upon whatever updraught there may exist in the flue; in many flues, even without a fire, there is to be found a strong natural updraught, which would create an exhaust through either the mica flap ventilator or the vertical tube, though in the latter there would be the increased friction to contend with and the resistance offered by drawing *downwards* the highly rarified air usually found at the ceiling level, especially when the gas is lighted, and the natural tendency of which is to ascend and not descend. It is simply going contrary to the laws of nature to try and ventilate a room by drawing the hot-air downwards.

We observe that the patentees recommend where there is a defective draught in the flue that a gas

jet or blast fan be employed to create an exhaust. We presume they do not contend that such an application is novel, and if they consider the use of either a gas jet or a fan as necessary before ventilation can be secured, for what are we indebted to their vertical tube and cylinder, which of themselves cannot possibly affect the draught one way or the other, they being admittedly inoperative and therefore useless unless an updraught either already exists or is created in the upcast flue by other means independent of and outside their arrangement, and which must certainly be credited with whatever current that may be found in the vertical pipe?

ROBERT A. BOYLE & SON (LIMITED).

64, Holborn Viaduct, October 11th, 1887.

SIR,—This system I have used years ago, and found it successful. It was known as Dr. Chowne's system. Dr. Chowne was also in the field before Tobin, as he brought in the fresh air upon the same principle as Tobin. C. B. A.

SIR,—May I be allowed to explain that as to the main function of the cylinder there can be no doubt. The cylinder or chamber, being in many cases in actual contact with the fire, becomes heated, the rarefication that ensues causes a rapid displacement of air without (or, better, combined with) the draught of the chimney acting on the end of the exit-pipe. It is exactly the same thing as heating a room and opening a window, the cooler air (because of its greater density) immediately displaces the warmer and rushes into the room. The interposition of the cylinder is absolutely necessary as a disconnector, otherwise the downcast and upcast pipes, being continuous, are liable to become heated by conduction, and then a reverse action is at once set up, or its efficiency is greatly impaired, as we have frequently proved by experiment.

G. B. MOSS.

*** Our correspondent, nevertheless, told us when we were examining the model that he did *not* know why the upcast draught should refuse to act without the cylinder, and suggested two or three theories without adopting any one of them.

ORDNANCE MAP SCALES.

SIR,—I notice that in your article on the Ordnance Survey in last week's *Builder*, one of the arguments put forth by the advocates for the $\frac{1}{2500}$ scale is that a square inch on a map drawn to that proportion equals exactly one English acre. I beg to state that this is not quite correct, as one square inch equals only 4822·53 square yards, and I fail to see that this is an acre. Although perhaps near enough for ordinary agricultural purposes, it would not answer if applied to town work.

In the case of the $\frac{1}{500}$ scale, one square inch will be found to contain 192·9 square yards.

F. C. WILLIAMS.

*** The word "exactly" should not certainly have been employed *sans phrase*; "practically" would have been more correct; but it is "exactly" to the eye; it would require a magnifying glass to detect the difference of the square inch and the acre on the $\frac{1}{2500}$ scale, and that was all that was intended.

FIRES IN THEATRES.

SIR,—I read Mr. Campbell's letter in your last week's issue, suggesting the engraving of the plan of every theatre on the back of the programme. Now, if everybody understood a plan the idea would be an excellent one; but my experience convinces me that not one in a hundred does.*

On one occasion I was retained upon an "ancient lights" case, before a special jury, and, notwithstanding the plans, sections, and photographs which were put in, the jury could not comprehend it, and ultimately a model had to be made in cardboard.

It has struck me that if a red light were placed over every door of exit, and a finger painted on glass (with a gas-jet behind), directing, the way would be quickly seen by the audience.

WILLIAM ADAMS.

COOKING STOVES.

SIR,—Can you or any of your readers inform me of a really good cooking-stove? It should be able to accomplish the following objects:—

1. Roast in front of fire as well as roast and bake in ovens.
2. Grill on top of fire as well as fry, and have a hot-plate for stews and sauces, boiling, &c.
3. Heat a boiler sufficient to give water for a bath when required.
4. Above all, it should ventilate so that the smell of the cooking should be carried away instead of permeating the kitchen, as is usual now.
5. I need hardly say it should be economical in coals.

I have had several stoves in my kitchen, and they are all faulty, and will only effect half the operations that a really efficient stove ought to accomplish. I would not mind the cost if I could find a stove that would effect the above objects.

Oct. 6th, 1887. PATERFAMILIAS.

* We have already expressed the same opinion.—ED.

PROVINCIAL NEWS.

Birmingham.—The *Birmingham Gazette* states that some Mediæval remains have been discovered in clearing the ground for new premises in that city. A new building is about to be erected in the Priory, and in the excavations for the foundations a massive red sandstone wall has been revealed, which is supposed to be a part of the hospital or priory of St. Thomas, founded in 1285. Arrangements have been made for the remains of the wall to be photographed and sketched.

Bournemouth.—The new mission hall in connexion with St. Michael's Church, Bournemouth, was opened by a special service on Michaelmas Day, at which workmen employed on the building, as well as the congregation of St. Michael's Church, attended. Mr. R. Pinder was the architect of the new building, and Messrs. E. Jones & Son the contractors. The cost was about 600*l.*

Bridgwater.—On the 6th inst., the formal opening of premises for the Young Men's Christian Association, to be known as the "George Williams" Memorial Hall, took place at Bridgwater. The hall has been built to commemorate the fact of Mr. Williams being founder of the organisation. The building has frontages to Eastover of 45 ft. and 83 ft. to Salmon-parade, and is designed in the Classic style of architecture. It has been executed with local red brick, relieved with Ham Hill stone dressings and white brick in the piers, the moulded string-courses being in moulded bricks. At the front of the building, on the ground-floor, a large reading-room and library, with secretary's room attached, has been placed. Behind the reading-room there is a meeting or lecture room, with accommodation for 130 adults. Attached to this room is the junior club-room. A gymnasium has also been fitted up with gymnastic appliances. The floor has been formed with solid wood blocks to deaden the sound. The large hall is 50 ft. in length by 30 ft. in width, and has a height of 24 ft., the total accommodation being for 460 adults. Towards the front, a large room intended as a young men's parlour has been placed. On the floor above are two other commodious rooms. The sanitary appliances are said to be arranged on the most approved scientific principles. Including the furniture, the entire outlay amounted to 3,600*l.* Messrs. W. G. Habershon & Fawckner, of London, Newport, and Cardiff, gratuitously prepared plans and specifications. Mr. H. W. Pollard, of Eastover, whose tender amounted to 2,490*l.*, was the builder.

Kingston-on-Thames.—The Corporation of Kingston-on-Thames, in a Bill which they propose to promote in Parliament next session will apply, among other privileges, for powers to provide additional wharf accommodation. The estimated expenditure of the improvement is from 1,000*l.* to 1,200*l.* This includes the cost of a concrete wall, with granite coping, necessary to give an additional frontage of 470 ft., with mooring rings or posts, and granite pitching, with stone steps 100 ft. wide for boats. The gross annual amount of tonnage unloaded at the public wharf at present is 26,000 tons, and it is estimated that about 1,500 tons more are carried by barges that are driven elsewhere to unload in consequence of the poor accommodation. Should the powers sought be granted, advertisements would probably be issued inviting tenders from contractors.

Newcastle.—At a meeting of the Town Council last week the Deputy Town Clerk (Mr. W. E. Cartwright) read the letter from the Lords of the Treasury, which has been already published, agreeing to a loan of 10,000*l.* for the purpose of executing the scheme of the public buildings, which comprises a free library, assembly room, council chamber, school of art, &c. The Public Buildings Committee recommend the Council to accept the tender sent in by Mr. John Gallimore, in April, 1886, for the erection of the buildings in accordance with the plans and specifications, at a cost of 12,000*l.* This was agreed to, and the Corporation seal affixed to the contract, the work to be completed by June 24th, 1889. It appears that the highest tender, by Messrs. Lucas, of London, was for 18,628*l.* It is to be hoped Mr. Gallimore may be able to carry out the work for less than two-thirds of that amount with satisfaction both to himself and the Corporation.

Redcar.—Major-General C. Phipps Carey held an inquiry at Redcar on the 6th inst. in response to an application from the Local Board to borrow 1,500*l.* for laying out pleasure-gardens. Mr. James Howcroft, their surveyor, presented the plans which he had prepared, and explained the mode of carrying out the proposed work.

Royton.—At a recent meeting of the Royton Local Board, the plans prepared by Mr. R. Vawser, C.E., Manchester, for the main drainage of the district, and the treatment of the sewage thereof at an estimated cost of about 27,000*l.*, were unanimously adopted, and the clerk was instructed to submit the same to the Local Government Board for their approval.

CHURCH-BUILDING NEWS.

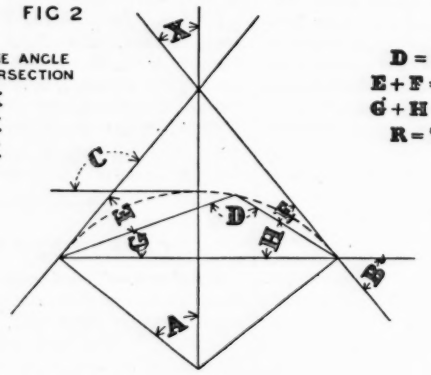
Dewsbury.—The consecration of the newly-built portion of Dewsbury Parish Church, took place on the 30th ult., the Bishop of Ripon officiating. The new part consists in the enlargement of the nave by 31 ft. in length and 24 ft. in width, this extension making the nave 98 ft. long. The north and south transept have been each increased 27 ft. by 30 ft., the chancel 46 ft. by 24 ft., the morning chapel 30 ft. by 19 ft., organ-chamber 30 ft. by 19 ft., clergy vestry 14 ft. by 12 ft., and choir-vestry 20 ft. by 13 ft. The length of nave and chancel together make a total length of 144 ft., the average height being 34 ft. Each transept has two three-light windows of varied designs. Several stained-glass windows have been added. The new east window, which is in seven lights, has also been filled with stained glass. On the south side of the chancel is a lofty double three-light stained-glass window, in memory of the Rev. Thomas Allbutt, M.A., for many years vicar of Dewsbury. On the same side of the chancel there are sedilia in three bays, with piscina adjoining. The screens on either side of the chancel, near the morning chapel, are of stone, with tracery heads and moulded cornices. Two porches, one on the north and one on the south side, have been added; the south porch has a stained-glass window. The walls of the new building have been built of ashlar, from Netherton quarries, Huddersfield. All the woodwork is of oak, and the roof of each transept is supported only on oak columns, from which rise circular ribs, and the roofs to the nave, chancel, and other parts of the new building, have richly-moulded principals, with elaborate oak tracery. The roofing is covered with lead and felt, on oak boards. The floors are for the most part of redwood blocks, by Messrs. Thomas Gregory & Co., of London, laid in pitch, on a bed of cement concrete. The floor of the chancel is covered with encaustic tiles, and the aisles with plain red and black, all by Messrs. Godwin & Sons, of Hereford. The seats are of oak, as also are the choir stalls; the latter being finely moulded, and having open fronts with tracery heads. The church is ventilated by inlet tubes and grates placed at the lower part of the window and outlet siding casements fixed in the windows. The church will be warmed by hot water on the low-pressure system, the pipes running under each aisle, and covered with perforated iron grates. The ground plan of this church was left by the late G. E. Street, R.A., but the whole of the elevations, with the exception of the chancel arcade, and all the details and fittings, are by Mr. A. E. Street. Mr. A. H. Kirk, a local architect, has superintended the whole of the works; the clerk of works being Mr. W. H. Williams. The heating apparatus have been gratuitously fixed by Messrs. M. Newsome, Sons, & Spedding, and the gas supply has been undertaken by Mr. H. Blackburn. The contract for the eastward extension was taken by Messrs. J. & W. Beanland, of Bradford, for the sum of 14,000*l.* It is proposed to make further alterations and additions at a future date.

Southport.—The new church of St. Philip's, Southport, was consecrated by the Bishop of Liverpool, on the 11th inst. The church consists of nave, north and south aisles, transepts, and chancel: on the south side of the latter are the vestries for clergy and choir, with moveable screens. The total length of the church internally is 131 ft., and across the transepts 77 ft.; the width of the chancel is 23 ft. The height of the nave from floor to wall-plate is 36 ft., and to apex of ridge 61 ft. The nave is divided by stone columns into fine bays. The nave is lighted on each side with ten clearstory windows, in the west front of which is a large traceried five-light window; the transepts showing externally as

CIRCULAR CURVES

RELATIVE VALUE OF USEFUL ANGLES TO ANGLE OF INTERSECTION

FIG 2

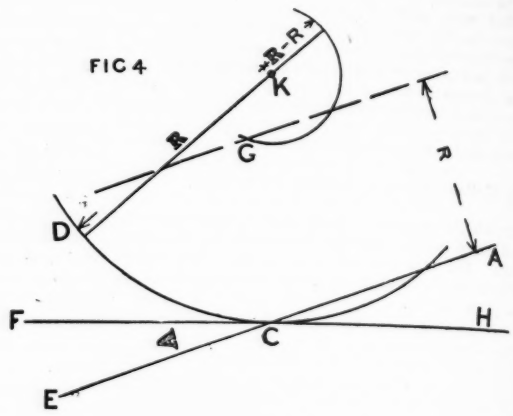


LET **X** = HALF THE ANGLE OF INTERSECTION

THEN **A** = 90° − **X**
B = 90° − **X**
C = 90° + **X**

D = 90° + **X**
E + **F** = 90° − **X**
G + **H** = 90° − **X**
R = T × TAN **X**

FIG 4



SETTING OUT WITH TWO THEODOLITES

IF ANY TWO LINES BE SET OUT FROM THE STARTING POINTS OF THE CURVE HAVING THE SUM OF THEIR TANGENTIAL ANGLES (**E** + **F**) = 90° − **X**, THE INTERSECTION OF THESE TWO LINES WILL BE A POINT IN THE CURVE.—BY A SERIES OF SUCH POINTS THE WHOLE CURVE MAY BE SET OUT IF THE COUNTRY BE SUFFICIENTLY OPEN TO ALLOW OF IT.—WHEN THE COUNTRY IS UNEVEN, THE METHOD SHOWN IN FIG 1 BY SHIFTING AND RE-SETTING UP THE THEODOLITE WHERE NECESSARY IS MORE APPLICABLE.—

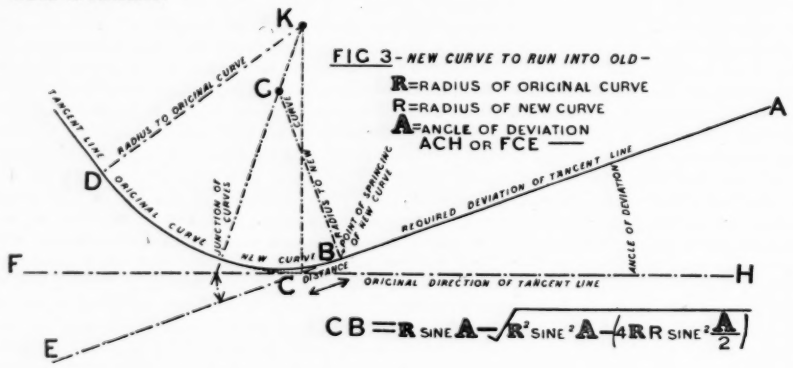
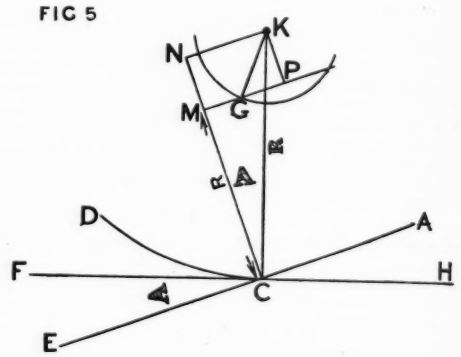


FIG 3 - *NEW CURVE TO RUN INTO OLD* -

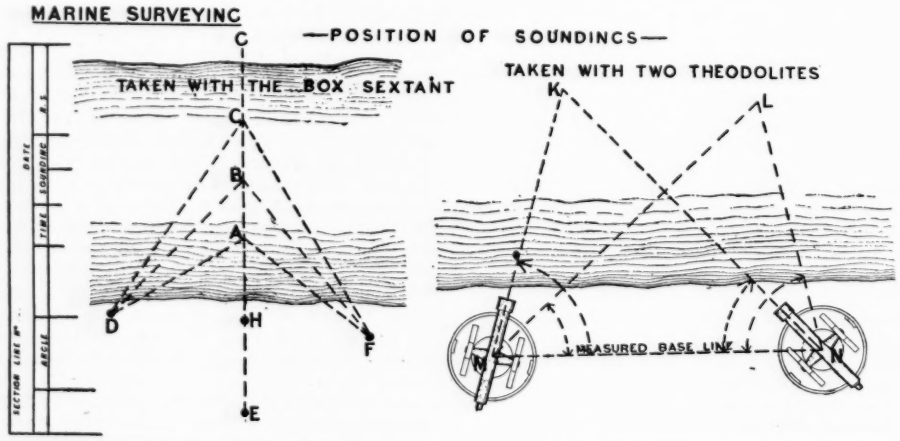
R = RADIUS OF ORIGINAL CURVE
R = RADIUS OF NEW CURVE
A = ANGLE OF DEVIATION ACH OR FCE —

$$CB = R \sin A - \sqrt{R^2 \sin^2 A - \left(4 R \sin^2 \frac{A}{2}\right)}$$

FIG 5



MARINE SURVEYING



coupled gables, with a four-light window in the centre of each gable: and the east end of the chancel has a five-light tracery window, with trefoil terminals to the main cuspings. At the west end of the south aisle rises a tower to the height of 110 ft. In the tower a bell by Messrs. John Taylor & Co., of Loughborough, is fitted, and provision is made for a peal of eight bells. The pulpit and font, in alabaster, are the work of Messrs. Norbury, Paterson, & Co., sculptors, of Liverpool, the carved oak communion-table being by the same firm. The chancel-floor has been laid with mosaic, by Messrs. Elliot, Olsten, Olney, & Co., of Manchester. The decoration of the nave and chancel with light and simple tints, with stencil patterns laid on, has been carried out by Mr. Reuben Bennett, of Manchester. The reredos is in oak, with carved panels, by a local carver, Mr. R. A. Macfeeter. The church was designed by Mr. R. F. Tolson, of Manchester, the style being known as Geometrical Gothic of an Early English type. Messrs. W. Brown & Son, of Stafford, were the general contractors for the undertaking.

Surveyorship Appointment.—Mr. Peter Dodd, who has for six years held the post of Assistant Surveyor to the Tunbridge Wells Local Board, has been appointed to the Town Surveyorship of Southend-on-Sea.

Tile Works.—Messrs. Malkin, Edge, & Co., of Burslem, have opened a London House, at Sandringham-buildings, Charing Cross-road.

The Student's Column.

LAND SURVEYING AND LEVELLING.

XVI.—SETTING OUT CURVES.

THE poles shown in the direction of the chord lines A B, A C, A D, fig. 1 (*Builder*, Oct. 8, p. 514), are not generally necessary. The usual method is for one man to hold one end of the chain at the last point determined, taking care, if the curve be flat, to place his body upon the outside of the curve, so as not to impede the line of sight when the theodolite is set for fixing the next point in the curve. The other assistant pulls out the chain or the tape to the given length, and holds up a peg or lath, which he keeps vertical at the correct distance, moving it about as directed by the surveyor, to the right or left hand, until it accurately appears in the required direction. Should any obstacle render it necessary to remove and re-set up the theodolite over a new point in the curve, the direction of a new tangent line must be found by the method shown in fig. 1 (Case 5), and the same process of setting-out by means of tangential angles re-commenced. The use of the tangential angles, which are calculated from the formula proved by Case 1 (*Builder*, Sept. 17, p. 412), enables the curve to be set out to the right-hand side of the tangent line, when the theodolite is placed over the beginning of the curve, as the primary scale of divisions upon the horizontal circle of the instrument is numbered to read in the direction of the hands of a watch: hence when the curve is to be set out to the left-hand side of a tangent line, the column upon the card containing the differences of the tangential angles must be adopted. Thus with a radius of 20 chains, if 1° 25′ 57″ be the tangential angle for a chord of one chain in length, and an angle of 2° 51′ 54″ be the tangential angle for the intersection of a second chord of one chain's length round the arc, when the curve is to be set out to the right-hand side of the tangent line; then the tangential angles to be employed for setting out two points at the same distances for a curve to the left-hand side of the tangent line will be 358° 34′ 3″ and 357° 8′ 6″ respectively.

Fig. 2 illustrates a method of setting out curves with the use of two theodolites, each set up respectively over points at the beginning and the end of a curve, when the angle of intersection between the tangent lines which pass through those points is known.

In road work curves may be set out by offsets from lines drawn upon a plan, and afterwards be checked by means of offsets from the tangent lines. In railway work it is always well to have a length of straight line between two curves. When in road-work it is desirable to accurately set out one curve running into another, the formula given in fig. 3 may be employed. The proof is given in figs. 4 and 5.

$$C B = R \sin. A - \sqrt{R^2 \sin.^2 A - 4\left(R r \sin.^2 \frac{A}{2}\right)}$$

If R = 7 and r = 5 when A = 20°

sin. A = sin. 20° = ·342

R sin. A = 7 × ·342 = 2·394

sin.² A = ·116964

R² sin.² A = 7 × 7 (·116964) = 5·731376

And $\sin. \frac{A}{2}$ = sin. 10° = ·173

$\sin.^2 \frac{A}{2}$ = ·029929

4 Rr (·029929) = 4·190060.

The square root of the difference between 5·731376 and 4·190060 equals 1·241.

And (2·394 − 1·241) = 1·153 = C B, the distance required.

In Marine Surveying, the use of two theodolites upon the shore can be employed for recording the position of a sounding by the intersection of lines making known angles with a given base-line. When the box sextant is used

by the surveyor out in a boat, the position is fixed by taking simultaneously the bearings of three known objects on shore, such as D, E, F, or in the case of a river section to be plotted upon the line E G, the bearing of two objects, D and F, situated respectively to the right and left of that line. The station pointer (see *Builder*, Sept. 3, p. 349) is used for recording upon the plan the position of the soundings thus taken.

STAINED GLASS.

Horstead.—A two-light painted Jubilee window, with subjects from St. Matthew and St. Paul introduced, has recently been erected in this parish church. The artists are Messrs. Charles Evans & Co., of London.

Leeds.—A stained-glass window has been presented to the church of the Holy Trinity, Leeds. The subject is the Raising of Jairus's Daughter, and it is in memory of some of the teachers in the Sunday School. It is from the studio of Messrs. Powell Brothers, of Leeds.

Merton Abbey.—Messrs. Chas. Evans & Co. have lately erected two painted windows, with subjects taken from "The Poor are the Lord's" and "He called them unto Him," at Christ Church, Mitcham, the gifts of Mr. M. J. Harris and Mr. H. Stevens.

Wednesbury.—The painted window, with subjects taken from the texts, "I was a stranger," and "Sick and ye visited me," subscribed for by the parishioners to perpetuate the memory of the Vicar's late wife, Mrs. Fanny Fisher Tuthill, has just been erected by the artists, Messrs. Chas. Evans & Co., who also supplied the ornamental brass, with inscription, at foot.

RECENT PATENTS.

ABSTRACTS OF SPECIFICATIONS.

13,616, Brickmaking Machinery. R. Scholefield.

The improvements in brickmaking machinery of the rotary type are in the direction of so regulating and adapting the apparatus that as the mould in one cylinder is being filled with clay, the contents of another mould in the same cylinder is being discharged and forced into the mould of a second cylinder; the same operation also ejecting a completely pressed form from a second or opposite mould in the same second cylinder. The cylinders, moulds, and rollers are all mounted on the same framework.

13,898, Step Ladders. J. T. Bower.

Two flaps of the ladder are connected by means of a rule or knuckle-jointed hinge, so that when the ladder is open the flaps or sides of the steps are kept apart. A self-acting catch is also affixed to the sides to keep the parts of the ladder together when closed. An additional leg is also fitted, and this, combined with the two parts of the steps, makes a kind of tripod, which gives great firmness to the ladder.

14,322, Water-closets. J. Smeaton.

Suitable improvements in the flushing apparatus and delivery ring are the subjects of this specification, which also relates to the masking of the ordinary appearance of a "rapid flush" or "flush-out closet" by a kind of vase. The distinctive name of "Amphora" is given to this description of basin on this last account.

14,448, Lock-bolt for Windows, Doors, &c. H. Johnson.

A small push bolt having an extra slit made in the catch socket so that when the bolt is pushed forward and turned a pin in the bolt engages therewith forms the lock-bolt claimed in this patent.

14,538, Circular Glass Ventilators. W. Sargent.

Instead of the circular ventilator moved with a stop, a spindle is arranged to a flange with an oval boss, underneath is another movable flange with a similar oval boss upon which the circular glass cover is placed, a double stop is fixed which only allows the cover to revolve a quarter of a turn. When necessary a spiral spring is fitted so that the ventilator may be moved backward and forward with a single cord.

15,642, Safes and Strong Rooms. G. Allen.

The improvement consists in hardening the rivets which hold together the different parts of safes, &c., so as to be as impregnable to a drilling instrument as the plate itself.

8,755, Flushing and Trapping Overflows to Water-Closets. E. Emmanuel.

Four or more indentations or channels are sunk into the basin from the top flushing rim directly connecting with the overflow holes which are recessed on the top side; the bottom outer edge being level with the outline of the basin. The inside of the holes are cut away at an angle, so that the water conveyed by the indentations or channels is conveyed directly into the overflow, thus thoroughly flushing and trapping it.

NEW APPLICATIONS FOR PATENTS.

Sept. 30.—13,230, H. Marle, Drawing-boards.—13,240, W. Scott, Heating and Ventilating Public and Private Buildings.—13,258, W. Dutton, Revolving Door-posts, &c., for Public Buildings and Theatres.

Oct. 1.—13,322, E. Solvay, Lime-kilns.—13,329, D. Ratcliff, Safes and Strong-rooms.

Oct. 3.—13,342, R. Platt, Window-sash Fastener.—13,376, B. Harrass, Artificial Compounds in Imitation of Wood.—13,389, D. Lang, Pipe Joint.

Oct. 4.—13,396, A. Wells, Revolving Wood Shutters.—13,421, R. Burkitt and G. Green, Combined Lifting Latch and Bolt.—13,434, R. Bradshaw, Fireproof Curtains or Partitions for Theatres.—13,444, W. Webb, Sewer Ventilation.

Oct. 5.—13,467, W. Smith, Manufacture of Cement.—13,472, J. Coppard, Closing or Opening Doors, Windows, &c.—13,497, H. Smith, Swing Doors.—13,508, W. Ballantine and R. Blackie, Flushing Cisterns for Water-closets.

Oct. 6.—13,524, W. Hearn, Fastening Windows.—13,528, J. Thrush, Traps for Drains.—13,537, T. Fawcett, Brick Making and Drying Machinery.

PROVISIONAL SPECIFICATIONS ACCEPTED.

11,966, J. Petter, Stoves and Fireplaces.—12,271, J. Davies, Brick Kilns.—12,524, 12,525, and 12,526, G. Snelus and Others, Manufacture of Cements.—11,591, R. Harrison, Flush Bolts for Doors.—11,752, J. Goodman, Bricks for the better Fixing of Woodwork and other Materials.—11,993, G. Woodcroft, Sash Fasteners.—12,133, T. Robinson, Cross-cut Saw-benches.—12,264, C. Mackey and E. Bailey, Securing Knobs to Doors.—12,771, W. Lake, Facilitating Escape from Burning Buildings.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

15,759, R. de Ridder and W. Bennett, Heating Public Buildings and Houses.—3,256, G. Jeffery, Covering for Roofs.—7,846, J. Anderson, Dovetailing Machines for Open Dovetails.—11,787, E. Bailey, Cupboard Turn.—14,557, C. Friedrick, Shop Counters.—15,542, J. Fisher, Latch for Doors, Windows, Gates, &c.—12,023, G. Hayes, Bars for Glazed Sashes.—12,031, H. Allison, Paints and Paint Compounds.

RECENT SALES OF PROPERTY.

ESTATE EXCHANGE REPORT.

October 3.

By E. Woods.

Wandsworth—88 and 90, Putney Bridge-road, freehold	£700
Camberwell New-road—No. 234, term 24 years, ground-rent 6*l.*	400
Lambeth—37 to 41, and 44, 45, and 46, King-street, 22 years, ground-rent 32*l.*	845
Stratford—8 and 10, Cruikshank-road, and 2, 4, and 6, Buckingham-road, 86 years, ground-rent 21*l.* 10s.	750
Hendon—1 and 2, Milton-road, 95 years, ground-rent 10*l.*	290

October 4.

By Sherrin & Coltman.

Kentish Town—8 and 10, Kelly-street, 50 years, ground-rent 8*l.*	510
New Cross—110, Malpas-road, 78 years, ground-rent 4*l.*	245

By H. Rutley.

Barnsbury—65, Bride-street, 72 years, ground-rent 6*l.*	300
Isleworth—3, Tolson-road, freehold	190

By Bean, Burnett, & Eldridge.

Wimbledon—The freehold residence, Ty Clyd	2,300

October 5.

By H. H. Montagu.

Stepney—1, John-street, copyhold	107

By Farebrother, Ellis, & Co.

Little Bognor, Sussex—the residences, Brookdean and The Holts, about 6 acres, freehold	5,100

By Cooper & Goulding.

Islington—Improved ground-rents of 70*l.*, term 32 years	980
A rental of 40*l.* a year, term 17 years	300

By Temple & Moore.

Homerton—119, 202, 204, and 236, Wick-road, freehold	1,125
Forest Lane—1 and 2, Sarah's-villas, freehold	395

By Dale & Son.

Bromley—95 to 101, odd, Swaton-road, 75 years, ground-rent 14*l.*	800
Bethnal Green—307, Cambridge-road, 80 years, ground-rent 10*l.*	450

October 6.

By Newbon & Harding.

Islington—82, Prebend-street, 40 years, ground-rent 4*l.* 4s.	315
13, Union-square, 40 years, ground-rent 5*l.* 5s.	460
Pentonville—23, Baker-street, 21 years, ground-rent 16*l.*	160
New North-road—11, Arlington-square, 40 years, ground-rent 6*l.* 6s.	535

By C. Willson.

Portland Estate—5 and 52, Foley-street, 17 years, ground-rent 46*l.*	1,050

MEETINGS.

Tuesday, October 18.

Parkes Museum (Lectures for Sanitary Inspectors).—Mr. C. E. Cassal, F.C.S., F.I.C., on "Food (including Milk), Sale of Food and Drugs Act." 8 p.m.

Glasgow Architectural Association.—Visit to the Athenæum Buildings. 5·15 p.m.

Manchester Architectural Association.—Conversazione. 7·30 p.m.

Wednesday, October 19.

Liverpool Engineering Society.—Mr. C. Harrison Townsend on "Ornament and Design: their Relation and Subordination in Engineering Works."

Builders' Foremen and Clerks of Works' Institution.—Quarterly meeting. 8·30 p.m.

Friday, October 21.

Parkes Museum (Lectures for Sanitary Inspectors).—Paper on "Infectious Diseases and Methods of Disinfection." 8 p.m.

Miscellanea.

Money Value of Human Life.—Sir Spencer Wells writing to the *Times* to correct a statement about a speech at the Hygienic Congress, says his estimate of the gain to the State of the increased numbers of human lives during the last fifty years, which may fairly be calculated as the fruit of medical and sanitary work, is "at least 300,000,000*l.* Any one who will refer to the invaluable work of the late Dr. W. Farr on 'Vital Statistics' may see the grounds upon which he has calculated that 'the minimum value of the population of the United Kingdom, men, women, and children, is 159*l.* a head; that is, the value inherent in them as a productive, money-earning race (page 61). Our population has increased in less than fifty years fully eight millions. Each individual of these eight millions was worth to the State 159*l.* It surely must be a very moderate estimate to regard two of these eight millions of increasing numbers of more healthy subjects as a clear gain due to sanitation, and the simple multiplication of two millions by 159*l.* gives the result 318,000,000*l.*"

The Imperial Institute.—The Building Committee having made a selection from a list of forty-six applicants to tender for the first portion of the foundations contract, received offers from the following firms:—J. & J. Greenwood, Brass & Sons, Thompson (Peterborough), Lovatt (Wolverhampton), Dover Bros., Lucas Bros., Macey & Son, Barnsley (Birmingham), Kirk & Randall, Munday & Sons, Higgs & Hill, Trollope & Sons, and Mowlem & Co. The tender of Messrs. Mowlem & Co. being the lowest, and their schedule of prices for extras comparing favourably with those of the other firms, their tender has been accepted by the committee, and the works will commence very shortly. Mr. G. Wallis, who was formerly Chief Clerk of the Works in the construction of the Royal Courts of Justice, has been appointed clerk of the works for this contract.

City Commission of Sewers.—At a meeting on the 11th, Mr. Graham King presiding, the Finance and Improvement Committee brought up a report on the memorial of inhabitants and ratepayers for widening the southern end of Milk-street in Cheapside. The committee were of opinion that the proposed improvement was a very desirable one, and they recommended that notices should be served to take the necessary property to carry it out. Mr. Green, in moving the adoption of the report, said there was no street between Wood-street and King-street sufficiently wide to allow of two vehicles passing abreast. The improvement would cost about 30,000*l.* Mr. Treloar thought the widening of Ludgate-hill, which had been twenty years in progress, ought to be completed before any fresh scheme was undertaken, while Mr. Deputy Bedford and other members advocated the widening of Fenchurch-street in preference. Ultimately the committee's report was adopted.

Birmingham Art Work for Australia.—There is just completed at the studio of the late John Raddis, Aston-road, a pulpit and font for a new church at East Maitland, N.S.W. The pulpit is supported by Devonshire marble columns, resting upon polished alabaster bases and surmounted by carved capitals. Above the floor line other marble shafts carry a number of canopied niches. In the centre compartment, which is larger than the others, Our Lord is represented seated on a throne with lambs lying at His feet, and His Apostles kneeling and standing around Him. In the recesses on either side are figures of Peter and Paul. Two other niches are occupied by Moses and Elias. The font is of Caen stone, with marble shafts.

The Lancashire and Cheshire Antiquarian Society held their first meeing of the session at Chetham College on the 7th inst. Professor Boyd-Dawkins, who presided, spoke of the important addition to archæological knowledge that had been obtained by the researches of General Pitt-Rivers, who, during the last three years, had been working out the Roman remains in the district of Wiltshire. General Pitt-Rivers had worked out in the neighbourhood of his house in Wiltshire a very remarkable series of Roman villages. Up to the present time the great Roman palaces in this country had been traced out, but they were not absolutely certain as to the condition of the country villages. General Pitt-Rivers had, however, explored in the neighbourhood of his house a whole set of villages, the date of which went back, according to the coins that were found, as far as A.D. 252. This discovery, he maintained, was of great importance, because it threw light on a period of history of which little was known.

Obituary.—We regret to announce the decease, on the 5th inst., of Mr. J. S. Edmeston, the eldest son of Mr. James Edmeston. Mr. J. S. Edmeston assisted his father in the carrying out of many of his works, one of the most recent being the large building known as Olympia, adjoining Addison-road Station, Kensington, which was designed by Mr. Cole, but completed under the superintendence of Mr. Jas. Edmeston. Mr. J. S. Edmeston was appointed early this year District Surveyor for Charlton, Lee, and Kidbrook.

Competition.—No less than sixty sets of plans have been sent in for the Gloucester Public Baths Competition, besides two others sent too late to be admitted. It is to be hoped the Gloucester Corporation, upon whose scheme all this labour has been expended, will feel it incumbent on them to make every effort towards discovering and adopting the best plans, apart from all partial considerations, so that the great number whose labour must be thrown away may at least have the satisfaction of feeling that they have been fairly treated.

Glasgow Artists and the International Exhibition.—As a result of the agitation by Glasgow artists for larger representation on the Fine Arts Committee of the International Exhibition, it has been agreed that five additional artists should be invited to join the committee. Mr. James Guthrie, Mr. A. K. Brown, and Mr. P. Macgregor Wilson were chosen from among the Glasgow artists; Mr. Robert Herdman, R.S.A., as representing the Royal Scottish Academy, and Mr. Colin Hunter, A.R.A., the Royal Academy.—*Scotsman.*

Bridge of Allan Museum.—The new Macfarlane Museum, which has been in course of erection for about two years, has just been formally opened. The founder was the late Mr. Macfarlane, who, after a very successful career in Manchester, returned to settle down in Bridge of Allan, spending his well-earned leisure in forming a collection of natural history objects. The building is of the Early French Gothic style of the thirteenth century.

New Art Museum at Kiel.—The Corporation of the city of Kiel has decided on erecting a new museum of art. The German Government has promised a grant of 5,000*l.* towards this object, provided that the cost of the building does not exceed 12,000*l.* Towards the balance, 7,000*l.*, the province of Holstein will contribute 5,000*l.*, the city of Kiel 1,500*l.*, and private persons 500*l.* A free site for the building will be granted by the town.

The New Palace of Christiansborg.—During the last few weeks the designs submitted for the new Palace of Christiansborg at Copenhagen, which was destroyed by fire some years ago, have been exhibited in the Arts Exhibition building in that city, but as yet none has been accepted by the committee of selection. The new building will accommodate the Court as well as the Houses of Parliament, but entirely separated from each other.

Paisley.—A new Congregational Church, erected from designs by Mr. John B. Wilson, of Glasgow, has just been opened at Paisley. The church is in Early Gothic style and has a tower and spire 100 ft. high. Sittings are provided for about 500 persons, and there are also a hall seating 200, class-rooms, vestry, ladies' room, &c. The total cost is under 3,000*l.*

A Correction.—We are asked to state that the slates used for the Church of Holy Trinity, Belle Vue, Shrewsbury, were not Sedan Green, but "Ashton & Green's Permanent Green."

Glasgow.—The Liberal Club in Buchanan-street was formally opened last week by Mr. James Campbell, of Tullichewan. The main entrance opens into a spacious hall with Corinthian columns and floor laid with mosaic tiles. In front is the grand staircase, lighted with large windows with stained glass. A dining-room, 60 ft. by 34 ft., the ceiling of which is treated in moulded panels, occupies the main portion of this floor. A recess at the side of the dining-room enclosed with stained glass screen forms a service-room, having a hoist, &c., in communication with the kitchen department on the basement floor. The semicircular heads of the windows and their lower portions are filled with rich-coloured stained glass, having appropriate figure subjects and ornamental designs. To the right of the entrance hall are the porter's desk and luggage-room, a writing-room with telephone, the clubmaster's business-room in communication with rooms upstairs, and a servants' stair, which extends from the basement floor to the attic, and thus isolates the servants entirely from the main portion of the house. This stair also communicates with the entrance from the court at the north end of the building for the reception of goods, and is overlooked from the clubmaster's office. Behind the stair on this floor are placed the cloak-room and spacious lavatory accommodation. On the principal floor are the reading and writing rooms, separated from each other by a glass screen; the lesser dining-room or smoking-room, —with service-room in communication with the kitchen,—adjoining; while the billiard and card rooms, having convenient lavatory accommodation attached, are placed on the mid-landing of the stair. The work has been carried out under the superintendence of Mr. Alexander Skirving. The following are the names of contractors and others employed on the building:—Messrs. A. & R. Anderson, builders; Messrs. Archibald M'Farlan & Son, joiners; Mr. R. S. Bathgate, plasterer; Messrs. Fulton & Walker, plumbers; Messrs. Buchan & M'Intyre, gas-fitters; Messrs. James Combe & Son, heating; Mr. John Orr & Co., painting; Messrs. M'Culloch & Gow, stained glass; Mr. Mair, inspector; Messrs. Shields & Walker, measurers. The furniture is being supplied by Messrs. Alex. Cree & Co. for the reading and writing rooms; Messrs. Cumming & Smith, the dining-room; Messrs. F. & G. Smith, the members' bed-rooms; Messrs. Moir & Kemp, the ironmongery; and Messrs. Norval & Wilson, the billiard-tables.

The Safety of Public Buildings.—At the Leamington Petty Sessions, the other day, the Mayor announced that, in consequence of the Exeter disaster, they had had all the local licensed buildings inspected by the Borough Surveyor, with the object of ensuring the safety of the public; and the magistrates had also visited the buildings themselves. At the Theatre Royal the only change necessary to make it absolutely safe was that there should be an additional door leading into the street from the orchestra stalls and the reserve pit. At the music-hall a new stone staircase, 6 ft. wide, was to be constructed from the ante-room into the street, and an additional hydrant placed on the stage. They suggested that Local Authorities should have additional powers conferred upon them to inspect other important buildings,—such as churches, chapels, places of amusement, and schools, and to require, where necessary, any alterations to be made to ensure the public safety in case of fire or panic. The Reading magistrates decided the other day to adjourn the application for a licence for the theatre for a month to give time to provide a better exit from the gallery, and to make other structural alterations. A similar course was taken with regard to the Town-hall and another building in order to provide better exits. At the request of the Justices of the borough of Middlesbrough, Mr. G. G. Hoskins, architect, of Darlington, has during the last fortnight inspected the Theatre Royal, Prince of Wales Theatre, Oxford Music-hall, Oddfellows' Hall, Cleveland Hall, Temperance Hall, and the Music-hall at the Albert Park Hotel, and made reports on the means of egress from the several places. The licence to the Oddfellows' Hall was renewed, and, after hearing the report, the Justices granted a provisional licence for one month to the Cleveland and Temperance Halls, during which period the suggestions of Mr. Hoskins are to be carried out. The question of renewing the licences of the two theatres, music-hall, &c., has not yet been considered.

Tree Planting and Drainage.—It is not merely an æsthetic fancy, but equally a prudent regard for the health of the community, which has led civic authorities to plant with bordering trees many of the greater thoroughfares in towns and cities. By this arrangement the advantages of a purer air and of shade in warm weather are gained for the townsman, besides the implied increase of space and the amenity conferred by thus practically transporting a strip of country into town. It is one of the happiest features in the development of cities now so rapid, that in their outer and growing zone the hard lines of road, wall, and railing are interrupted at frequent intervals by spaces of green sward and by the luxuriant foliage of climbing shrub and spreading tree. In so far we have learnt the lesson of experience, and, in thus preserving round our homes a healthy atmosphere and some degree of rustic beauty, are wiser for ourselves than the town dwellers of a former generation. Still, we are not always duly careful even in our wisdom, as the sequel shows. This very custom of tree-planting in streets is open to a danger fortunately not common, but still grave enough to counteract, where it exists, the best effects of rural surroundings. It has happened repeatedly, as we are reminded by the letter of a recent writer on this subject, that the roots of trees in their growth have sought out the crevices of drain-pipes adjacent, and penetrating these, have grown with such vigour on the nourishment which they found there as completely to choke the pipes and prevent the exit of sewage. We have here, of course, no argument against the continuance of the boulevard system, but certainly a caution, enjoining first the more perfect adaptation of drain segments, and secondly, a kind of care not always observed in the relative arrangement of wayside shrubs and trees.—*Lancet.*

Ravenscourt Park.—We are informed that the Metropolitan Board of Works and the Hammersmith Vestry have at last secured to the public for ever the thirty odd acres of meadow and foliage which form the beautiful demesne of Ravenscourt Park. For some considerable time it was very doubtful whether it would be given up to building purposes or devoted to public use, as, after accepting the offer of the Local Authorities, the owners placed the estate in Chancery, when a higher bid was made for it by a Nottingham gentleman, which the Court of Chancery was bound to accept; meanwhile, the Board had obtained Parliamentary powers to borrow the required purchase money. The purchaser then offered to sell the property to the Board at a profit, reserving to himself the mansion and gardens around it. This being declined, other terms were arranged, and the park and house were obtained at a cost of 58,000*l.* It is expected that the park will be thrown open early in the ensuing spring. A library and museum are proposed to be located in the house, which is a quaint old place, having many panelled rooms and a handsome old oak staircase. The acquisition of the park will manifestly be of great benefit to the surrounding neighbourhood, which will now probably come more under the attentive notice of the enterprising builder.

A Technical School for Preston.—The Harris Trustees, Preston, have granted out of the funds at their disposal 30,000*l.* towards the furnishing and endowing of a technical school for Preston. Of this, 10,000*l.* only can be spent upon the building and furnishing. After consulting with members of the Royal Commission and others, the Council of the Harris Institute, the present technical school, have decided to apply to the Preston Corporation for a grant of 10,000*l.* towards the erection of the new school, it being felt that 20,000*l.* will be required to build and furnish an efficient school, which will contribute largely to the improvement of the operatives and artisans and to the commercial development of the district. The Preston Corporation have already consented to provide a central site.

New Law Court for the City.—The works have been commenced in connexion with the new City of London Court, and the foundation-stone is very shortly to be laid by Mr. Bridgman, chairman of the Law and City Courts Committee of the Corporation. The site is in Guildhall-buildings, Basinghall-street, near the old Bankruptcy Court. The building will be erected from the design of Mr. Andrew Murray, and the contract has been taken by Mr. Morter, of Stratford, for 13,637*l.*

Metropolitan Board of Works Improvement.—On Tuesday afternoon Mr. George Edwards, deputy-chairman of the Metropolitan Board of Works (who was accompanied by Mr. E. Rider Cook, J.P., and Mr. J. Lenanton, representatives of the Poplar district at Spring-gardens), opened the new street between Cotton-street and Prestons-road, Poplar, constructed at a cost of about 15,000*l.*, a moiety of which was paid by the Metropolitan Board, who recognised the improvement as a metropolitan one. The new street will enable the heavy traffic from the east side of the South-west India Dock and from the large factories at Cubitt Town to pass into the East India-road, without making, as hitherto, an awkward and dangerous detour through a very narrow part of High-street, Poplar.

PRICES CURRENT OF MATERIALS.

TIMBER.	£.	s.	d.	£.	s.	d.
Greenheart, B.G. ....ton	6	5	0	7	10	0
Teak, E.I. ....load	8	0	0	12	10	0
Sequoia, U.S. ....foot cube	0	2	3	0	3	0
Ash, Canada ....load	3	0	0	4	10	0
Birch ,, ...	2	0	0	3	10	0
Elm ,, ...	3	10	0	4	10	0
Fir, Dantsic, &c.	1	10	0	4	0	0
Oak ,, ...	2	10	0	4	10	0
Canada	3	0	0	6	0	0
Pine, Canada red	2	0	0	3	10	0
,, yellow	2	0	0	4	0	0
Lath, Dantsic ....fathom	3	0	0	5	0	0
St. Petersburg	4	0	0	5	10	0
Wainscot, Riga ....log	0	0	0	0	0	0
,, Odessa, crown....	2	10	0	3	0	0
Deals, Finland, 2nd and 1st...std.100	7	0	0	8	0	0
,, 4th and 3rd	5	10	0	6	10	0
Riga	5	10	0	7	0	0
St. Petersburg, 1st yellow	8	10	0	13	0	0
,, 2nd ,, ...	7	0	0	8	0	0
,, white	6	10	0	8	10	0
Swedish	6	0	0	14	0	0
White Sea	0	0	0	0	0	0
Canada, Pine, 1st	16	0	0	24	0	0
,, ,, 2nd	10	0	0	15	0	0
,, ,, 3rd, &c.	6	0	0	9	0	0
,, Spruce, 1st	8	0	0	9	0	0
,, ,, 3rd and 2nd	5	0	0	7	0	0
New Brunswick, &c....	5	0	0	6	10	0
Battens, all kinds	4	0	0	10	10	0

TIMBER (*continued*).	£.	s.	d.	£.	s.	d.
Flooring Boards, sq., 1 in., prepared, First	0	8	0	0	11	0
Second	0	6	6	0	7	6
Other qualities	0	4	0	0	6	0
Cedar, Cuba ....foot	0	0	3½	0	0	3½
Honduras, &c.	0	0	2½	0	0	3½
Australian	0	0	2	0	0	3
Mahogany, Cuba	0	0	4	0	0	6½
St. Domingo, cargo average	0	0	4	0	0	5½
Mexican ,, ...	0	0	3	0	0	3½
Tobasco ,, ...	0	0	3½	0	0	5
Honduras ,, ...	0	0	3½	0	0	5
Maple, Bird's-eye	0	0	5	0	0	7
Rose, Rio ....ton	8	0	0	11	0	0
Bahia....	7	0	0	9	0	0
Box, Turkey ....ton	5	0	0	12	0	0
Satin, St. Domingo ....foot	0	0	5	0	0	9
Porto Rico	0	0	6	0	0	10
Walnut, Italian	0	0	3½	0	0	5
METALS.						
Iron—Bar, Welsh, in London...ton	4	15	0	5	0	0
,, ,, in Wales	4	2	6	4	10	0
,, Staffordshire, London	5	10	0	6	0	0
Copper—						
British, cake and ingot ....ton	43	10	0	44	0	0
Best selected	44	10	0	45	10	0
Sheets, strong....	50	0	0	0	0	0
Chili, bars	39	12	6	40	0	0
Yellow Metal....lb.	0	0	4½	0	0	4½
Lead—						
Pig, Spanish ....ton	12	0	0	0	0	0
English, common brands....	12	2	6	0	0	0
Sheet, English	13	5	0	0	0	0
Spelter—						
Silesian, special ....ton	15	15	0	15	17	6
Ordinary brands....	15	12	6	0	0	0
Tin—						
Straits....ton	105	15	0	0	0	0
Australian	106	10	0	0	0	0
English ingots	108	10	0	0	0	0
OILS.						
Linseed ....ton	19	12	6	19	15	0
Cocoanut, Cochin	30	0	0	32	0	0
Ceylon	23	15	0	24	0	0
Palm, Lagos	22	0	0	0	0	0
Rapeseed, English pale	25	5	0	25	10	0
,, brown	24	0	0	0	0	0
Cottonseed, refined	20	15	0	0	0	0
Tallow and Oleine	25	0	0	45	0	0
Lubricating, U.S.	5	0	0	6	0	0
,, refined	5	0	0	12	0	0
Turpentine—						
American, in casks ....cwt.	1	4	9	0	0	0
Tar—						
Stockholm ....barrel	0	14	0	0	14	6
Archangel	0	9	6	0	9	9

CONTRACTS AND PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

CONTRACTS.

Nature of Work, or Materials.	By whom required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.	Page.
Construction of Railway, &c....	Halifax Hgh. Lvl.&c. R.C	J. Fraser & Sons	October 15th	ii.
Bath-Room to Workhouse	Edmonton Union....	T. E. Knightley....	October 18th	ii.
Slop Vans....	Mile End Vestry	J. M. Knight	October 19th	ii.
Alteration of Lavatory Fittings	Lambeth Guardians....	*Official*	do.	ix.
Workmen's Institute, &c., York	North Eastern Rail. Co.	W. Bell....	do.	ii.
Underground Urinals, &c....	Com. of Sewers....	*Official*	October 21st	ii.
Construction of Shed for Steam-Roller	Hendon Local Board ...	S. S. Grimley	October 24th	ix.
Steam Road-Roller and Water-Cart	do.	do.	do.	ix.
Temporary Mortuary	do.	do.	do.	ix.
Cleaning and Painting Pier, &c.	Met. Asylums Board ...	*Official*	do.	ix.
County Police-Station at Snodland	Kent Justices	do.	do.	ii.
Fitting-up P.O. at Redditch	Com. of H.M. Works...	do.	October 25th	i.
Cast-Iron Work....	Com. of Sewers....	do.	do.	ii.
Coast Guard Station, Isle of Wight....	Admiralty	do.	do.	ii.
Cornish Boiler	Uxbridge Local Board...	G. Eves	do.	ii.
Wrought-Iron Roof, &c....	Canterbury Cor.	*Official*....	October 26th	ix.
Ironwork	Hackney Board of Wks	J. Lovegrove....	do.	ii.
Making-up Roads, &c....	Bromley U. R. S. A. ...	*Official*	October 27th	ix.
Granite and Ballast	Walthamstow Local Bd.	H. S. Ridings....	October 28th	ix.
Postal Sorting-Office, Highgate	Com. of H.M. Works...	*Official*	do.	ii.
Bath-Rooms, W.C.'s, & Extension of Kitchen	Bromley Union....	do.	do.	ix.
Broken Granite and Pit Gravel, &c.	Finchley Local Board...	G. W. Brumell....	October 31st	ix.
Making-up Roads, &c....	Bromley Local Board...	H. S. Cregeen	Nov. 1st	ix.
Kitchen, Scullery, &c., at Workhouse....	Barnet Union	*Official*	Nov. 3rd	ii.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.	Page.
Clerk of Works	Hendon Local Board ...	3*l.* 3s. weekly....	October 24th	xiv.
Steam Road-Roller and Engine-Driver	do.	Not stated	do.	xiv.
Foreman of Paviors and Sewermen....	St. Olave Bd. of Wks....	2*l.* 5s. weekly....	do.	xiv.

TENDERS.

ADDISCOMBE (Surrey).—For proposed extension to the Church of St. Mary Magdalene. Mr. Dan. R. Dale, F.R.I.B.A., architect:—

Hoare & Son	£1,800 0 0

[No competition.]

AMLWCH.—For the erection of a gamekeeper's cottage on the Marquis of Anglesey's Estate at Amlwch. Mr. W. E. Jones, architect, Menai Bridge:—

Owen Thomas, Amlwch (accepted) ...	£170 0 0

BROMLEY (Kent).—For the erection of two shops, Bromley, Kent, for Mr. Harris. Mr. W. A. Williams, architect, 51, High-street, Bromley. Quantities by Mr. William Mills, 26, Budge-row, Cannon-street, E.C.:—

T. Crossley....	£1,950 0 0
W. A. Grubb....	1,875 0 0
J. C. Arnard & Son....	1,830 0 0
D. Payne (accepted)	1,725 0 0
C. Satchell	1,673 0 0

CHICHESTER.—For alterations and repair to Rancton House, near Chichester. Mr. T. S. Archer, F.R.I.B.A., architect:—

Holt	£1,260 0 0
Dearle	1,055 0 0
Rodgers	1,022 15 0
Evans, Southsea	935 0 0
Budden	900 0 0

CLERKENWELL.—For erecting premises in Clerkenwell-close, E.C., for Mr. William Pye. Messrs. Iron & Higgins, architects, 9, Buckingham-street, Adelphi. Quantities by Mr. A. J. Beesley:—

G. F. Williams	£1,479 0 0
W. Stubbs	1,433 0 0
Brass & Son	1,396 0 0
J. & J. Greenwood	1,386 0 0
J. Hunt	1,386 0 0
Twyford & Carter....	1,349 15 10
Grover & Son....	1,334 0 0
S. R. Lamble (accepted)	1,287 0 0
W. Buckeridge (withdrawn)....	1,120 0 0

CROYDON (Surrey).—For completing two detached villas on the Blunt Farm Estate, South Croydon. Mr. Dan. R. Dale, F.R.I.B.A., architect:—

Hoare & Son....	£650 0 0
Docking	575 0 0
Horrocks (accepted)	525 0 0

EASTON.—For a new vicarage-house at Easton, near Wells, for the Rev. J. Holderness. Messrs. Barker & Cross, architects, Weston-super-Mare.

Dowland (accepted)	£1,385 0 0

EGERTON (Kent).—For a parsonage-house at Egerton, near Pluckley, Kent, for the Rev. F. Mercer. Mr. Temple L. Moore, architect, 6, Downshire-hill, Hampstead, N.W. Quantities by Mr. John B. Lofting, Norfolk-road, Maidenhead:—

Silver & Sons, Maidenhead	£2,080 0 0
Thompson, Peterborough	1,985 0 0
Higgs, London	1,970 0 0
Wood & Son, Boughton Monchelsea	1,940 0 0
Edwards, Charing	1,905 0 0
Vaughan, Maidstone	1,863 0 0
Knock, Ashford*	1,775 0 0

* Accepted, subject to alterations.

EGHAM (Surrey).—For additional works at Milton Park, Egham, for Baron de Worms. Mr. Dan. R. Dale, F.R.I.B.A., architect:—

Hoare & Son (accepted)....	£1,500 0 0

[No competition.]

LAMBETH.—For enlarging the Victory-place School (East Lambeth B) by 37 places, for draining, tar-paving, and enclosing the additional land purchased by the Board, and for carrying out the additions and improvements to the existing school, for the School Board for London. Mr. T. J. Bailey, architect:—

F. R. Turtle	£4,579 4 4
King Bros. & Co....	3,855 0 0
J. Tyerman....	3,660 0 0
C. Cox	3,636 0 0
T. L. Green	3,493 0 0
J. Marsland	3,485 0 0
Norris & Luke	3,394 0 0
H. L. Holloway....	3,285 0 0
Stimpson & Co....	3,276 0 0
W. Johnson	3,239 0 0
S. J. Jerrard*	3,239 0 0
W. Buckeridge	3,216 0 0

* Recommended by the Works Committee for acceptance.

LONDON.—For the extension of the offices in Old Broad-street, E.C., for the Managers of the Stock Exchange. Mr. J. J. Cole, architect, 24, Finsbury-circus, E.C. Quantities by Mr. James Barnett, 90, Cannon-street, E.C.:—

Killby & Gayford	£13,420 0 0
Ashby Bros....	12,987 0 0
J. T. Chappell....	12,622 0 0
Colls & Sons....	12,440 0 0
A. Bush....	12,139 0 0
Lawrence & Sons	11,985 0 0
W. Brass & Son (accepted)....	11,777 0 0

LONDON.—For alterations and additions to Nos. 87 and 88, Cadogan-place, S.W., for Mr. Barker. Mr. W. M. L. Seaman, architect:—

Lascelles....	£2,500 0 0!
Martin....	2,288 19 7
Drew & Cadman	2,254 0 0
Green & Lane	2,222 0 0
Garlick....	2,198 0 0
Rhodes....	2,175 0 0
Scharien	2,097 0 0
Stimpson....	2,090 0 0
Robson....	2,022 0 0
Ockenden	1,997 0 0
Rayment....	1,907 0 0
White	1,891 17 6
Smith	1,844 0 0
Ingram	1,788 0 0
Ashford	1,770 0 0
Braid	1,692 0 0
Bowd & Lightfoot	1,560 0 0
Hewitt....	1,381 0 0
Groome	790 0 0!

LONDON.—For works at St. Mary's Church, Spital-square, for the Rev. Morris Thomas. Mr. Dan. R. Dale, F.R.I.B.A., architect:—

Pritchard & Son (accepted)....	£240 0 0

[No competition.]

LONDON.—For alterations at the Golden Last tavern, Cannon-street, E.C. Mr. R. A. Lewcock, 88, Bishopsgate-street Within, E.C., architect:—

J. Walker	£1,300 0 0
Salt	1,221 0 0
J. Anley	983 0 0
Jackson & Todd	960 0 0
J. Ivory	945 0 0
Speam & Co.	940 0 0
Steel Bros.	875 0 0
Stephenson....	858 0 0

LONDON.—For an improvement at the Carpenters' Arms, James-street, Oxford-street. Mr. R. A. Lewcock, architect, 88, Bishopsgate street Within, E.C.:—

J. Walker	£134 0 0
Barrett & Power	123 0 0
Speam & Co....	110 0 0
Goodall	102 0 0
Steel Bros....	69 0 0
Stephenson	55 0 0

LONDON.—For the rebuilding of shop and premises, No. 16, Great Turnstile, for Mr. H. B. Read, under the superintendence of Mr. William Eve, 10, Union-court, Old Broad-street, E.C.:—

Baxter....	£809 0 0
Harris & Wardrop	795 0 0
Stubbs....	776 0 0
Johnson	741 0 0
Patman & Fotheringham	738 0 0
Dabbs	721 0 0
Godfrey & Son	720 0 0
Holland	719 0 0
F. & H.F. Higgs, Loughboro' Junction*	695 0 0

* Accepted.

LONDON.—For the erection of vicarage for St. Thomas's, Regent-street, on site of Nos. 12 and 13, King-street, Regent-street, W. Messrs. George Lansdown & Harriss, Warwick-street, Charing Cross, architects :—

Kirk & Randall	£4,306	0	0
Stimpson & Co.	4,075	0	0
S. G. Bird	4,040	0	0
W. Downs	4,037	0	0
Colls & Son	4,029	0	0
J. Morter	3,995	0	0
Bywaters	3,880	0	0
H. & E. Lea (accepted)	3,791	0	0

LONDON.—For stables and workmen's dwellings, West Smithfield, for Messrs. Williamson. Mr. Geo. Pearson, architect, Warnford-court, E.C. :—

Peacock Bros. (accepted)	£2,462	0	0*

* Exclusive of cost of party walls.

MARYLEBONE. — For the enlargement of the Burghley-road School (Marylebone, W²) by 400 places, for the School Board for London. Mr. T. J. Bailey, architect :—

W. Evans	£3,899	0	0
T. Bendon	3,862	0	0
T. L. Green	3,858	0	0
S. & W. Pattinson	3,793	17	4
H. L. Holloway	3,735	0	0
H. Hart	3,723	0	0
Stimpson & Co.	3,612	0	0
Wall Bros.	3,589	0	0
W. Johnson	3,436	0	0
W. Buck-ridge*	3,243	0	0

* Recommended by the Works Committee for acceptance.

NORTHAMPTON.—For additions to Northampton General Infirmary. Mr. W. Hull, architect :—

Cosford	£3,997	0	0
Fisher	3,800	0	0
Finnegan	3,750	0	0
Branson	3,733	0	0
Jarvis, Banbury	3,650	0	0
Reynolds	3,600	0	0
Green Bros.	3,568	0	0
Clayson	3,560	0	0
Martin (accepted)	3,560	0	0
Wingrove	3,455	0	0

PLASHET.—For new Congregational schools, Plashet, for the Committee. Mr. E. C. Robins, architect :—

Brass	£4,107	0	0
Wall Bros.	4,055	0	0
Master	4,019	0	0
Bywaters	3,969	0	0
Harris & Wardropp	3,953	0	0
Manley	3,894	0	0
E. Lawrence & Son	3,825	0	0
C. Ansell, Lambeth (accepted)	3,772	0	0

PUTNEY.—For new wing and restorations to Colebrook Lodge, Putney Heath. Mr. Dan. R. Dale, F.R.I.B.A., architect :—

Hoare & Son (accepted)	£2,570	0	0

[No competition.]

RAMSGATE.—For converting St. James's Theatre into a parish hall, for the Rev. H. Bartram. Messrs. Hinds & Son, architects :—

Sackett Bros.	£190	0	0
Miller	186	0	0
Jarman	164	0	0
Bowman	157	10	0
Duckett	150	0	0
Martin (accepted)	137	0	0
Collins	135	0	0

WEST HAM.—For altering and extending the Infants' Department of the Odessa-road Schools, situate in Odessa-road, Forest Gate, E., for the West Ham School Board. Mr. J. T. Newman, F.R.I.B.A., architect, 2, Fen-court, Fenchurch-street, E.C. Quantities by Messrs. R. L. Curtis & Son :—

G. J Hosking	£2,037	0	0
J. Morter	1,993	0	0
A. Reed	1,989	0	0
North Bros.	1,960	0	0
J. Catley*	1,889	0	0

* Accepted, subject to approval of Education Department.

WEST HAMPSTEAD.—For marble-mosaic paving at Hackney College. Mr. M. P. Manning, architect :—

W. & M. Mainzer (accepted)	£151	0	0

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